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Epidemiology and Disease Surveillance Portfolio/Injury Prevention Program

Evaluation of Student Injuries at the Sergeants Major Course (SMC), Fort Bliss, Texas, August 2013–May 2014

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14. ABSTRACT <p>Two years after the closing of the Army Physical Fitness Research Institute, an active duty Army physical therapist was once again assigned to serve the Army Sergeants Major Academy (SMA) students. Purpose: To evaluate the effects of an on-site physical therapist on injuries and physical fitness of Sergeants Major Course (SMC) students and assess risk factors for injury among the SMC students. Methods: Injury risk factors, physical fitness, and injury data were collected by survey from a SMC class with a physical therapist, Class 64, in September 2013 and May 2014. SMC Class 63 did not have a dedicated, on-site physical therapist (PT), so was used for comparison. For both classes, rosters and electronic APFT results were obtained from the SMA and medical records were obtained from the Defense Medical Surveillance System (DMSS). Semi-structured interviews with the SMC physical therapist provided initial program background and intent, and follow-up details of the program implementation, strengths, weaknesses, and next steps. Results: A total of 406 students in Class 64 took both surveys (77 percent). Most students who took both surveys were male (89%), over age 40 (62%), Army (93%) and active duty (90%). APFT run times and BMI did not change during SMC attendance, while APFT sit-up and push-up performance increased by 2 to 3 repetitions. The proportion of students treated for injury during the SMC for Class 64 was slightly higher than Class 63 (70% vs. 64%, p=0.07). The incidence of lower extremity injury medical encounters was statistically significantly higher in Class 64 (57% vs. 50%, p=0.02). Nearly half of all SMC students in Class 64 had seen the SMC physical therapist and 46 percent of those who had seen the physical therapist stated they would not have sought physical therapist care if she had not been co-located at the school. Conclusions: Based on this evaluation of the short-term effects on injury and fitness, we cannot definitively recommend for or against the placement of a physical therapist at the SMC. More students sought treatment for injuries, in particular lower extremity overuse injuries, in Class 64 compared to Class 63, which was similar in age, gender, APFT pass rate, and prior injury. This may have been due to increased access to timely care due to an on-site physical therapist. However, it is not possible to rule out effects of unmeasured factors (e.g., physical activity levels, new treatment or physical training policies). Maintenance of physical fitness could not be directly attributed to the presence of the physical therapist. Survey results suggested that co-location of the physical therapist was of value. Future evaluations would benefit from collection of process metrics, additional factors influencing injury incidence, and additional outcomes of interest.</p>					
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Table of Contents

	<u>Page</u>
1 Summary	1
1.1 Purpose	1
1.2 Results	1
1.3 Conclusions and Recommendations.....	2
2 References	3
3 Authority	3
4 Background	3
4.1 Physical Therapists in the U.S. Army	4
4.2 Physical Therapy at the Sergeant Majors Academy	4
5 Methods	5
5.1 Data Collection	5
5.2 Data Analysis.....	7
6 Results	9
6.1 Survey Analysis: Demographics, Physical Fitness, Health Behaviors, and Physical Therapy Use.....	9
6.2 Medical Records Analysis: Injury Rates, Injury Types, and Clinic Use	14
6.3 Risk Factors for Injury.....	21
7 Discussion	26
7.1 Injuries and Physical Fitness	26
7.2 Physical Training Activities	27
7.3 Physical Therapy Use	28
7.4 Injury Risk Factors	29
8 Conclusions	30
9 Recommendations	30

	<u>Page</u>
10 Point of Contact	30

Appendices

A	References.....	A-1
B	Sergeants Major Course (SMC) Class 64 Initial Survey.....	B-1
C	SMC Class 64 Follow-up Survey	C-1
D	Comparison of Survey Respondents (Evaluation Sample) and Non-Respondents, SMC Class 64	D-1
E	Comparison of Evaluation Sample and All Other Survey Respondents, SMC Class 64	E-1
F	Comparison of Self-Reported Army Physical Fitness Test (APFT) Results and Unit Records, SMC Class 64	F-1
G	Summary of all Tobacco Use Survey Responses, SMC Class 64	G-1
H	Summary of Dietary Habits Survey Responses, SMC Class 64	H-1
I	Additional Injury Details from Survey Responses, SMC Class 64	I-1
J	Risk of Injury by Demographic, Physical Fitness, and Physical Activity Characteristics, Class 64	J-1

Figure

1	Proportion of Injuries Treated by Clinic During the Sergeants Major Course, Class 64 vs. Class 63	16
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Tables

1	Demographics of Evaluation Sample, Sergeants Major Course Class 64	9
2	APFT Performance and Body Mass Index Before and During the Sergeants Major Course, Class 64.....	10
3	BMI by CDC Classifications Before and During the Sergeants Major Course, Class 64.....	10
4	Tobacco Use and Personal PT Activities Before and During the Sergeants Major Course, Class 64.....	11
5	Use of Physical Therapist During the Sergeants Major Course, Class 64.....	13
6	Demographics from Electronic Medical Records: Sergeants Major Course Class 64 vs. Class 63	14
7	Injury Incidence Prior to and During the Sergeants Major Course, Class 64 vs. Class 63	15
8	Injury Visits by Diagnosis and Body Region (Barell Matrix) for Acute Injuries during the Sergeants Major Course, Class 64	17
9	Injury Visits by Diagnosis and Body Region for Injury-related Musculoskeletal Injuries during the Sergeants Major Course, Class 64	19
10	Association of Demographic, Physical Fitness, and Physical Activities with Injury during the Sergeants Major Course, Class 64	21

Technical Report No. S.0023113-14, Aug 2013–May 2014

11	Predictors of Reported Injury during the Sergeants Major Course: Multiple Logistic Regression Results, Class 64.....	22
12	Association of Demographic, Physical Fitness, and Physical Activities with Lower Extremity Overuse Injury during the Sergeants Major Course, Class 64.....	23
13	Predictors of Reported Lower Extremity Overuse Injury during the Sergeants Major Course: Multiple Logistic Regression Results, Class 64	24
14	APFT Performance and Sprint Training Frequency during Personal Physical Training, Class 64	25

Technical Report No. S.0023113-14
Evaluation of Student Injuries at the
Sergeants Major Course (SMC), Fort Bliss, Texas
August 2013–May 2014

1 Summary

1.1 Purpose

In 2011 the Army Physical Fitness Research Institute (APFRI) was closed and its staff disbanded due to funding, removing health promotion and performance optimization services from its prior locations: the Army War College, the Army Sergeants Major Academy, and Command and General Staff College. The APFRI physical therapist assisted with providing the health promotion and performance optimization services; they did not treat patients. Starting in August 2013, an active duty Army physical therapist was once again assigned to work with students at these schools. However, physical therapist duties included clinical care in addition to physical fitness and injury prevention consultation.

The objectives of this project were to (1) evaluate the effects of an on-site physical therapist on injuries and physical fitness of Sergeants Major Course (SMC) students and (2) assess risk factors for reported injury among the SMC students.

1.2 Results

In August 2013, 526 Service members were listed on the enrollment roster for the SMC class with a physical therapist (Class 64). Of the 470 men and 56 women enrolled, 456 (87 percent) completed the initial survey and, in May 2014, 458 (87 percent) completed the follow-up survey. A total of 406 students (77 percent) took both surveys; these students were included in the evaluation sample. In the evaluation sample, most students were male (89 percent), over age 40 (62 percent), Army (93 percent), active duty (90 percent), and there were slightly more students representing the combat arms (39 percent) and combat service support (38 percent) occupational specialties.

On average, students' cardiorespiratory endurance (two mile run time performance and body mass index (BMI) remained the same while attending the SMC, while muscular endurance slightly improved (three additional push-ups and two additional sit-ups). There were no statistically significant changes in the proportion of students in each of the Centers for Disease Control and Prevention (CDC) BMI categories ($p=0.92$). During the SMC, there were no statistically significant changes in the proportion of cigarette smokers (8-9 percent), or the proportion of smokeless tobacco users (12-13 percent).

With regard to personal physical training (PT), nearly all students performed PT on their own time (99 percent). Most students incorporated distance running into their personal PT program (over 85 percent), running between 5-19 miles per week. One third (33 percent) of students reported that their personal PT program included Traditional Army PT (running, sit-ups, and push-ups). Statistically significant changes in the following personal PT activities were observed: more aerobic endurance training other than running (29 percent vs. 43 percent reporting ≥ 3 times per week, before vs. during the SMC, respectively); more resistance training (47 percent vs. 54 percent ≥ 3 times per week, before vs. during the SMC, respectively); less sprint or interval training (59 percent vs. 46 percent ≥ 1 time per week, before vs. during the SMC, respectively); and more cross-training, and/or off-the-shelf physical training programs during SMC than before the SMC.

Technical Report No. S.0023113-14, Aug 2013–May 2014

Approximately half (48 percent) of survey respondents saw the SMC physical therapist. Among those who saw the SMC physical therapist, 46 percent said they would not have seen her if she was not co-located at the school. Nearly all (96 percent) said they would recommend visiting the SMC Physical Therapist to their classmates or students in the next class.

Electronic medical records data showed a rate of 6.95 injuries per 100 students per month in the SMC class with a physical therapist (Class 64). In this class, the cumulative reported injury incidence during the SMC was statistically significantly higher than their cumulative reported injury incidence one year prior to the SMC (69.5 vs. 61.1 percent injured, $p < 0.01$, risk ratio and 95 percent confidence interval = 1.14 (1.04, 1.25)).

Comparisons of injury-related electronic medical records data with a prior class that did not have a physical therapist indicated that the proportion of Soldiers receiving treatment for an injury one or more times prior to the SMC was not statistically different for these classes (61.1 vs. 58.6 percent, $p = 0.41$). The proportion of students reporting injuries during the SMC for the class with a physical therapist was slightly higher than the class without a physical therapist, with borderline statistical significance (69.5 vs. 64.2 percent, $p = 0.07$). The incidence of reported lower extremity injury was statistically significantly higher in the class with the physical therapist (57.4 vs. 50.4 percent, $p = 0.02$).

Visit data showed that a greater proportion of injuries in Class 64 (34 percent) were treated by the Physical Therapy Clinic compared to the prior class, during which 13 percent of injuries were seen in the Physical Therapy Clinic. In the prior class (Class 63), the Family Practice Clinic treated the greatest proportion of injuries, over 25 percent.

Leading traumatic injuries treated during the SMC for Class 64 were sprains and strains (50.6 percent), fractures (16.9 percent), and dislocations (10.2 percent), according to electronic medical records data from all clinics where medical treatment for injuries were received. Leading body regions affected were the lower extremity (54.8 percent) and upper extremity (13.9 percent). Leading injury-related musculoskeletal diagnoses treated during the SMC for Class 64 were related to inflammation and pain (67.0 percent). Leading body regions affected by injury-related musculoskeletal conditions were the spine and back (42.4 percent) and lower extremity (34.3 percent).

An analysis of risk factors for injury during the SMC indicated that APFT run time performance and injury in the prior 12 months were predictors of treatment for injury, and more specifically lower extremity overuse injury, among male students during the SMC. Independent predictors of lower extremity overuse injury among males during the SMC also included having a personal PT program that did not include sprint training.

1.3 Conclusions and Recommendations

This evaluation found that more SMC students sought treatment for injuries, in particular lower extremity overuse injuries, in Class 64 compared to a prior class (Class 63) that was similar in age, gender distribution, APFT pass rate, and prior injury incidence. Class 64 had a physical therapist assigned to serve the SMC students and clinic use data indicated that injuries were more commonly treated by physical therapy in Class 64 compared to Class 63. Survey data confirmed interactions with the physical therapist were occurring as well; nearly half of all Class 64 students had seen the SMC physical therapist. The presence of the physical therapist may have resulted in higher reported injury incidence due to increased access to on-site care. Increased interaction with the physical therapist could be beneficial, given the improved health outcomes demonstrated in prior studies of programs linking healthcare providers with the workplace. However, it is not possible to rule out the effects of other unmeasured factors on reported injury incidence among Class 64 students (e.g., physical activity levels, new medical treatment or physical training policies).

With regard to physical fitness, cardiorespiratory endurance and body composition did not change in the SMC class with a physical therapist (Class 64), while muscular endurance improved slightly. It is notable that despite being in a school environment with classroom activities that are inherently inactive, the SMC students were able to maintain physical fitness (as measured by APFT performance) and BMI during the SMC. However, these results cannot be directly attributed to the presence of the physical therapist.

Other than the findings on reported injuries and physical fitness, there were a number of other important lessons learned about the program. The value of co-locating the physical therapist with students was evident from survey responses showing that 46 percent of those who had seen the physical therapist stated they would not have sought physical therapy care if she had not been co-located at the school. Nearly all (96 percent) of those who visited the SMC physical therapist said they would recommend visiting the SMC physical therapist to their classmates.

Based on this evaluation of the short-term effects on reported injury and fitness, we cannot definitively recommend for or against the placement of a physical therapist at the SMC. Future evaluations would benefit from pre- and post-implementation measurement of additional factors contributing to injury risk in a comparison population, such as a survey that would capture physical activity levels and APFT performance. Documentation of the program elements and collection of process metrics, such as changes in physical fitness or injury prevention knowledge following injury prevention education activities, would also assist with understanding the exact outcomes that would be expected to be influenced by the presence of the physical therapist. In addition, use of qualitative methods could assist with identifying or ruling out factors, such as policy changes, that influence outcomes such as injury incidence and identifying other effects, such as Command perceptions of care and effects on unit cohesion.

Further study of long-term effects on the future health and performance (e.g., recurrence of injury, disability) of these non-commissioned officer (NCO) leaders, and the health and performance of their Soldiers, is needed. In addition, while injury and physical fitness are key outcomes to assess, future evaluations should consider analyses of cost savings and collecting additional measures such as Soldier functional status, time to return to functional status, and quality of life. Other measures to consider include general physical health, mental health, quality of work life, and medication use (Franche et al. 2005).

2 References

See Appendix A for references.

3 Authority

The authority for this evaluation is Army Regulation 40-5, paragraph 2-19a, which tasks the U.S. Army Public Health Center (Provisional) (APHC (Prov)), (formerly Army Public Health Command and U.S. Army Center for Health Promotion and Preventive Medicine), to provide “support of Army preventive medicine activities through consultations, program evaluations...in the areas of disease and injury prevention and control...health surveillance and epidemiology...” (Department of the Army (DA) 2007).

4 Background

Injuries are a leading health issue across the Army, affecting individual and unit readiness (Jones et al. 2010). Senior leadership is not exempt. Two previous investigations of injuries among Army War

College students showed injury incidences of 44 percent (2000) and 56 percent (1999) during the 10-month academic year (Knapik et al. 1999; Knapik et al. 2002). Injury rates specific to physical fitness training within the academic year were 49.7 percent, according to a 1995 medical record review at the Sergeants Major Academy (Cosio-Lima et al. 2013).

The SMC is a 10-month curriculum designed to prepare senior noncommissioned officers for leadership positions in the Army and Department of Defense. Master sergeants and sergeant majors attend over 1,400 instructional hours of coursework that aims to enhance critical reasoning, creative thinking, and decision-making skills necessary to transition from tactical to operational and strategic-level planning.

4.1 Physical Therapists in the U.S. Army

The concept of assigning physical therapists to serve particular units is not new; physical therapists are valued in particular for their expertise in evaluating and treating nonsurgical musculoskeletal conditions and have deployed to combat areas since the Vietnam War. Studies have shown that medical schools and non-orthopedic residency programs do not sufficiently educate physicians on musculoskeletal medicine (Matzkin et al. 2005; Clawson et al. 2001; Freedman and Bernstein 1998). In the absence of physical therapists, the burden of injury diagnosis and treatment inordinately falls upon orthopedic surgeons (Davis et al. 2006). Having a physical therapist who can serve as a ‘physician extender’, allowing orthopedic surgeons to focus on surgical cases, has been reported as invaluable in many combat settings (Davis et al. 2006; Garber and Baxter 2004; Greathouse et al. 1994). Availability of specialists in musculoskeletal injury care is especially important for the Army, given that injury is the most common reason for seeking medical care during deployment (Belmont et al. 2010; Cohen et al. 2010; Hauret et al. 2010) and in garrison (Jones et al. 2010), with over 1.3 million injury-related medical encounters in 2012 alone (Marshall et al. 2013).

The advantages of forward-deployed physical therapy care that have been described include early diagnosis and treatment, avoidance of referral wait time or avoidance of medical evacuations from theater, maintenance of personnel strength and unit cohesion, and higher Soldier and leader satisfaction with care (Moore et al. 2013; Zambraski and Yancosek 2012). When physical therapists have deployed on field training missions, reports suggest that one-third or more of all sick call visits are treated by the physical therapist and a majority (>90 percent) are returned to duty (Moore et al. 2013; Davis et al. 2006; Greathouse et al. 1994). Physical therapists are also trained in health promotion and injury prevention, and can serve as advisors to commanders and Soldiers with regard to physical fitness, PT, performance optimization, and injury prevention (Garber and Baxter 2004; Greathouse et al. 1994).

4.2 Physical Therapy at the Sergeant Majors Academy (SMA)

In 2011, the Army Physical Fitness Research Institute (APFRI) was closed and its staff disbanded due to funding, removing health promotion and performance optimization services from its prior locations at the Army War College, the Army SMA, and Command and General Staff College. The APFRI physical therapist assisted with providing the health promotion and performance optimization services; they did not treat patients. (For further description of the APFRI concept and services, see Parker et al. 2001). Starting in August 2013, an active duty Army physical therapist was once again designated to work with students at these schools as part of an Executive Wellness Program. The physical therapist provides clinical care as well as injury prevention, with the goals of enabling early treatment of new injuries, effective rehabilitation of existing injuries, and prevention of new injuries through targeted physical fitness education focused on injury prevention principles.

At the SMC, which is part of the SMA (Fort Bliss, Texas), the physical therapist has a duty position in the William Beaumont Army Medical Center Department of Preventive Medicine under the Executive Wellness Program. The Executive Wellness Program consists of an active duty Army physical therapist (officer), a physical therapy technician (enlisted, E-7), and a dietician, all of whom are assigned to serve the SMC students. The physical therapy technician assists with implementation of installation programs across Fort Bliss. While relationships with the SMC are currently informal, the physical therapist is co-located with the students in an area consisting of a classroom and two offices near the SMC classrooms. The classroom was converted to a rehabilitation gym and clinic, with amenities similar to an MTF physical therapy clinic. The physical therapist has access to Armed Forces Health Longitudinal Technology Application (AHLTA) and eProfile from this location, and students have direct access to the physical therapist during breaks from classes, which are held 0800-1600 daily during the 10-month SMC. The SMC physical therapist location differs from the Army War College and Command and General Staff College, where the physical therapists currently provide services from an off-site clinic.

The primary mission of the physical therapist is to serve the SMC students. At the time of this report, the SMC physical therapist provided a two-hour lecture to the students at the start of the course, attended weekly SMC staff meetings, attended morning student Physical Readiness Training (PRT) sessions held twice a week, managed and provided care for students seeking treatment of musculoskeletal injuries, and developed and executed selected injury prevention and performance optimization activities for the students. A forty-hour course on PRT was part of the SMC curriculum and was graded as Go/No Go. In addition, the SMC physical therapist, along with Master Fitness Trainers from Fort Bliss' First Armored Division, held a quarterly Train the Trainer with the SMC small group instructors and cadre for 1.5 hours each morning for four days.

This report describes an evaluation designed to (1) evaluate the effects of an on-site physical therapist on injuries and physical fitness of the SMC students and (2) assess risk factors for reported injuries among the SMC students.

5 Methods

5.1 Data Collection

The Army Public Health Center-Provisional (APHC (Prov), formerly the U.S. Army Public Health Command began evaluation planning in August 2013, following initial discussions during the Army Medical Specialists Corps Injury Prevention/Human Performance Optimization Council and in further consultation with the SMC physical therapist and Office of the Surgeon General Physical Performance Service Line, Rehabilitation and Reintegration Division. In August-September 2013, APHC designed a survey in consultation with the SMC physical therapist and entered the survey into the Remark Office OMR[®] survey scanning software. In September 2013, the APHC Public Health Review Board reviewed and approved the project as public health practice.

5.1.1 Surveys

In September 2013, the initial survey (Appendix B) was administered to Class 64. The survey collected information on known injury risk factors (for example, physical activities, tobacco use), health behaviors of interest to the tasking authority (for example, PT activities, dietary habits), and injuries prior to the SMC. APHC (Prov) provided paper copies of the survey to the SMC physical therapist, who then provided the surveys to the First Sergeant. Ultimately, surveys were distributed through the Core Advisors to the Small Group Advisors, who administered and collected the surveys. Paper copies were

returned through a tracked package service to APHC (Prov) Injury Prevention for scanning and quality checks.

A follow-up survey (Appendix C) was prepared in March 2014 and administered prior to graduation in May 2014 to capture current information on injury risk factors and injuries for which treatment was sought during the SMC. The survey was revised to enable completion online using Verint® electronic survey software (version 7.2.140715.14). An email was sent to the Small Group Advisors and class leadership with a link to the survey for distribution to the students.

5.1.2 Unit Rosters and Army Physical Fitness Test (APFT) Data

The SMC physical therapist obtained electronic versions of the class roster and APFT results on Class 64. Data included name, social security number (necessary to link to electronic medical records data), component, height, weight, body fat, APFT date, and scores for push-ups, sit-ups, and 2-mile run time. Details on APFT administration are described in Field Manual (FM) 7-22 (DA 2012).

5.1.3 Electronic Medical Records

Electronic data for injury-related medical encounters contained in the Defense Medical Surveillance System (DMSS) were requested for Class 64 from the Armed Forces Health Surveillance Center (AFHSC) in order to capture injuries for which treatment was sought. The following demographic information was requested: social security number, name, date of birth, gender, race, Service, Component, rank, education level, and marital status. This information was necessary to fill in complete survey data, allow for linkage to roster and APFT data, and facilitate comparisons with a prior class. The medical data request was limited to inpatient and outpatient medical encounters in the following International Classification of Diseases, Ninth revision, Clinical Modification (ICD-9-CM) code range: ICD-9-CM 710-739 (Diseases of the Musculoskeletal System and Connective Tissue) and ICD-9-CM 800-999 (Injury and Poisoning). Overuse and chronic conditions are captured in ICD-9-CM 710-739 and traumatic injuries are captured in ICD-9-CM 800-999. The following data points were requested for each encounter: date, ICD-9-CM diagnosis code(s) and ICD-9-CM external cause of injury codes (E-codes), Standard North Atlantic Treaty Organization Agreement (STANAG) cause codes (inpatient only), disposition, and clinic where treatment was received. Data encompassing SMA attendance (13 August 2013 - 6 June 2014) were requested. To assess prior injury, data for one year prior to attendance (13 August 2012 – 12 August 2013) were also requested.

5.1.4 Comparison Class

DMSS and APFT data for the previous SMC class (Class 63) were obtained for comparison purposes since a physical therapist was not assigned to work with this class. Roster and unit records of APFT results were obtained by the SMC physical therapist from administrative points of contact associated with the SMC. DMSS injury-related electronic medical records data were requested from AFHSC for the period of SMC attendance (14 August 2012 - 21 June 2013) and for one year prior to attendance (13 August 2011 – 12 August 2012).

5.1.5 Semi-structured Interview with Physical Therapist

Semi-structured interviews were held with the SMC physical therapist at the start and end of the program. The initial interview gathered program background and intent, while the final interview gathered details of the program implementation, strengths, weaknesses, and next steps.

5.2 Data Analysis

5.2.1 Survey Data Analysis

Unless otherwise specified, IBM SPSS® Statistics, version 19, was used for all data management and analyses. Data obtained from the initial survey and follow-up surveys were merged. Military occupational specialties were grouped according to Department of Army occupational code groupings defined in FM 7-21.13 (DA 2004). Current cigarette smokers were defined as those Soldiers who smoked at least one cigarette within the last thirty days and smoked 100 or more cigarettes in their lifetime. Current smokeless tobacco users were defined as those Soldiers who reported smokeless tobacco use in the last 30 days. Physical fitness was assessed using performance on the APFT and BMI. BMI was calculated as weight in kilograms divided by height in meters squared (kg/m^2) and was categorized according to the CDC (CDC 2015) classifications for underweight (< 18.5), normal (18.5-24.9), overweight (25.0-29.9), and obese (≥ 30). PT weekly running distance was calculated from average running frequency per week multiplied by average miles per run.

To enable the comparison of individual-level changes in reported injury and fitness, an evaluation sample was created from those SMC students who had responded to both surveys, i.e., individuals for whom data was available both at the start and end of the SMC.

To assess potential differences between the evaluation sample and those who did not take the survey, medical record and unit APFT data on all SMC students in Class 64 were obtained. Demographics, incidence of injuries receiving treatment, and APFT performance were compared. Data on international students were not included in this comparison, given that electronic medical records and APFT results were not available for these students. For comparisons of categorical data, results of Mantel-Haenszel chi-square tests of proportion are reported. For comparisons of continuous (APFT) data, results of t-tests are reported.

To assess potential differences between the evaluation sample and all surveys collected, medical record data and survey responses to demographic, health behavior, injury, and APFT results were compared. For comparisons of categorical data, results of Mantel Haenszel chi-square tests of proportion are reported. For comparisons of continuous (APFT) data, results of t-tests are reported.

To assess the validity of self-reported APFT data among the SMC students, self-reported APFT survey data were compared to unit records. Pearson correlation coefficients are reported. The strength of the association was based on the following established limits: correlations from 0 to 0.25 indicate little or no relationship; from 0.25-0.5 indicate a fair degree of relationship; from 0.5 to 0.75 indicate a moderate to good relationship; and greater than 0.75 indicate a very good to excellent relationship (Dawson 2004).

5.2.2 Electronic Medical Records Analysis

Injury indices used to measure and monitor military-relevant injuries in previous studies as well as in ongoing surveillance (Knapik et al. 2006) were created using ICD-9-CM codes in the DMSS data. Injury indices measured 'any injury' (Comprehensive Injury Index, Installation Injury Index) and 'lower extremity overuse injury' (Training-Related Injury Index). The Installation Injury Index (III) is a code set recommended by the DoD Injury Metrics Working Group for monitoring military injuries (DoD Military Injury Metrics Working Group 2002). The Comprehensive Injury Index is a slightly broader code set based on the III. The Training-Related Injury Index is a set of codes defined for use in identifying and monitoring common lower extremity training-related injuries. Further description of the indices is

available in Knapik et al., 2006. A visit was classified as injury-related if an injury diagnosis code appeared as one of the first four diagnosis codes. Cumulative incidence of reported injuries in the year prior to the SMC and during the SMC were calculated and include students injured one or more times (i.e., number of students with one or more injury-related medical encounters divided by the total number of students with a medical record, multiplied by 100).

Frequencies and distributions of demographic and reported injuries from the electronic medical records are reported for Class 63 and 64. Results of Mantel Haenszel chi-square tests of proportion were used to assess differences. The distributions of all injury visits by clinic are also presented for each Class.

To assess the effects of a physical therapist assigned to serve the SMC students on injuries, the cumulative injury incidence of injuries receiving treatment among students in the prior class that did not have a physical therapist assigned to serve the students (Class 63) was compared to the current class (Class 64). Differences in the proportions of reported injuries during their academic year were assessed using the chi-square test statistic available in OpenEpi (Sullivan, 2015), which assesses statistical association between the two groups using the z-score. The risk ratio and 95 percent confidence interval (CI) around the risk ratio are also obtained from OpenEpi and reported.

The proportions of visits by clinic for each class are reported to assess differences in clinic use. The SMC physical therapist recorded her visits under the Physical Therapy Clinic code, BLAA.

The Barell Matrix (Barell et al. 2002) is used to present electronic medical record codes for all traumatic injury visits (ICD-9-CM 800-999) by diagnosis and body region for Class 64. The injury-related musculoskeletal matrix (Hauret et al. 2010) is used to summarize all visits for injury-related musculoskeletal conditions by diagnosis and body region. For these matrices, the primary (first) diagnosis code in the record is used. Where the primary code is a V-code or is not a code included in the pre-defined matrix cells, the visit is not included in the matrix.

5.2.3 Factors Associated with Reported Injury during the Sergeants Major Course

To assess factors associated with injuries for which care was sought during the SMC, injury risk ratios and 95% CI were calculated using the electronic medical record data on overall injuries reported during the SMC as the outcome variable. Risk factors were obtained from initial survey responses or demographics available from medical records. Estimated percent body fat was used in place of BMI. Estimated percent body fat was calculated using an equation described by Gallagher et al. that considers age, ethnicity, gender, and BMI (Gallagher et al. 2000). APFT run times for men and women were grouped into tertiles of fastest, moderate, and slowest performance separately. APFT sit-up and push-up performance was grouped into tertiles of low, moderate, and high performance separately for men and women. Multiple logistic regression models were used to identify factors associated with (1) any reported injury and (2) reported lower extremity overuse injury during SMA. A backward-stepping model was used to explore independent predictors ($p \leq 0.05$ required for entry into the model; $p \geq 0.10$ required for removal from the model). Independent predictors were then entered into a model that controlled for age and gender. Odds ratios and 95 percent CI of univariate models and the final multivariable models are reported. Injury risk ratios and 95 percent CI were also calculated and are presented in Appendix J.

6 Results

6.1 Survey Analysis: Demographics, Physical Fitness, Health Behaviors, and Physical Therapy Use

In August 2013, the roster listed 526 Service Members enrolled in Class 64 of the Sergeants Major Course. Of the 470 men and 56 women enrolled, 456 (87 percent) completed the initial survey and, in May 2014, 458 (87 percent) completed the follow-up survey. A total of 406 students (77 percent) took both surveys; these students were included in the evaluation sample.

A comparison of survey respondents and non-respondents is presented in Appendix D. Few differences in demographics and physical fitness existed (p values ≥ 0.05), indicating the evaluation sample was likely representative of the SMC Class 64 with regard to gender, age, race, marital status, education, Service, Component, and physical fitness as measured by APFT performance at the start and end of the SMC. However, a higher proportion of non-respondents sought treatment for injury during the SMC (79 percent vs. 67 percent, non-respondents vs. respondents, respectively, $p=0.02$).

A comparison of the evaluation sample and all survey respondents is presented in Appendix E. Very few differences in demographics, health behaviors, reported injury incidence, and physical fitness existed (p values ≥ 0.05), indicating the evaluation sample was very similar to all survey respondents.

A comparison of self-reported and unit APFT records can be found in Appendix F. Consistent with what has been found in basic training and operational units (Jones SB et al., 2007; Martin et al., 2015), self-reported AFPT results were highly correlated to unit records (Pearson product-moment correlation coefficients range: 0.85-0.90). Given this result, self-reported APFT results were used in subsequent analyses.

6.1.1 Survey Demographics of the Evaluation Sample

In the evaluation sample ($n=406$ who took both surveys), most students were male (89 percent), over age 40 (62 percent), Army (93 percent) and active duty (90 percent), and there were slightly more students representing the combat arms (39 percent) and combat service support (38 percent) occupational specialties (Table 1).

Table 1. Demographics of Evaluation Sample, Sergeants Major Course Class 64

Variable	Categories	Initial survey n (%)
Gender	Male Female	362 (89) 44 (11)
Age (years) Mean age: 41.85 ± 4.31	≤40 41-43 ≥44 Missing	155 (38) 128 (32) 120 (30) 3
Service	Army Air Force Coast Guard Marines International	379 (93) 1 (<1) 1 (<1) 4 (1) 21 (5)
Component	Active Duty National Guard Reserve Missing	367 (90) 7 (2) 32 (8) 0
Military occupational specialty group	Combat arms Combat support Combat service support Missing	149 (39) 83 (22) 147 (38) 27

6.1.2 Physical Fitness Before and During the Sergeants Major Course (SMC)

Students' run time performance and BMI did not change while attending the SMC ($p>0.05$), while push-up and sit-up performance on the APFT improved ($p<0.01$) (Table 2). On average, for both males and females, push-up performance increased by approximately three repetitions and sit-up performance increased by approximately two repetitions. There were no statistically significant changes in the distribution (percent) of students by CDC BMI categories ($p=0.92$) (Table 3).

Table 2. APFT Performance and Body Mass Index Before and During the Sergeants Major Course, Class 64 (n=406)

Variable	Gender	n	Before the SMC (Initial survey) (mean±SD)	During the SMC (Follow-up survey) (mean±SD)	Absolute Difference	Paired t-test Initial vs. follow-up (p-value)
2 Mile Run (minutes and fraction of a minute)	All	315	15.87 ± 1.71	15.89 ± 2.06	+0.02	0.57
	Male	284	15.60 ± 1.51	15.66 ± 1.95	+0.06	0.49
	Female	31	18.12 ± 1.73	18.03 ± 1.76	-0.09	0.62
Push-Ups (repetitions)	All	377	56.6 ± 15.0	60.2 ± 15.6	+3.3	<0.01
	Male	339	58.5 ± 13.8	62.7 ± 14.2	+4.2	<0.01
	Female	38	39.4 ± 14.5	38.5 ± 8.9	-0.09	0.69
Sit-Ups (repetitions)	All	358	63.4 ± 14.8	66.5 ± 14.4	+3.1	<0.01
	Male	322	62.9 ± 14.7	65.7 ± 14.3	+2.8	<0.01
	Female	36	68.6 ± 14.2	73.2 ± 13.4	+4.6	<0.01
BMI (kg/m ²)	All	406	26.9 ± 2.5	27.0 ± 2.6	+0.1	0.29
	Male	362	27.2 ± 2.4	27.3 ± 2.5	+0.1	0.30
	Female	44	24.5 ± 1.9	24.5 ± 2.2	0.0	0.88

Table 3. BMI by CDC Classifications Before and During the Sergeants Major Course, Class 64 (n=406)

Variable	Categories	Before the SMC (Initial survey) n (%)	During the SMC (Follow-up survey) n (%)	Chi-square, initial vs. follow-up
BMI (kg/m ²) Males & Females	≤ 24.9 (Normal*)	77 (19)	73 (18)	0.47
	25.0 to 27.5 (Low-Overweight)	182 (45)	177 (44)	
	27.6 to 29.9 (High-Overweight)	103 (25)	108 (27)	
	≥ 30 (Obese)	44 (11)	48 (12)	
BMI (kg/m ²) Males	≤ 24.9 (Normal)	46 (13)	50 (14)	0.82
	25.0 to 27.5 (Low-Overweight)	167 (46)	159 (44)	
	27.6 to 29.9 (High-Overweight)	103 (28)	100 (28)	
	≥ 30 (Obese)	46 (13)	53 (15)	
BMI (kg/m ²) Females	≤ 24.9 (Normal)	27 (61)	21 (48)	0.39
	25.0 to 26.0 (Low-Overweight)	9 (20)	14 (32)	
	26.1 to 29.9 (High-Overweight)	8 (18)	9 (20)	
	≥ 30 (Obese)	0 (0)	0 (0)	

*Note: 2 students (<1%) were underweight (BMI<18.5) and were grouped with the Normal category.

6.1.3 Tobacco Use and Personal PT Before and During the Sergeants Major Course (SMC)

As shown in Table 4, during the SMC, there were no statistically significant changes in the proportion of cigarette smokers (8-9 percent), or the proportion of smokeless tobacco users (12-13 percent). With regard to personal PT, nearly all students performed PT on their own time (99 percent). Most students included distance running in their personal PT program (over 85 percent); this proportion did not differ substantially between surveys ($p=0.07$). Most ran between 5 and 19 miles per week. Most students (>60 percent) reported other aerobic endurance training sessions of 31 to 60 minutes in duration. Duration of resistance training was typically 31 to 60 minutes. One third (33 percent) of students reported that their personal PT programs included Traditional Army PT (as defined by FM 21-20; primarily calisthenics, running, sit-ups, and push-ups). Statistically significant changes in the following personal PT activities were observed:

- Aerobic endurance training other than running increased in frequency (43 percent vs. 29 percent reporting ≥ 3 times per week, during vs. before the SMC, respectively).
- Resistance training increased in frequency (54 percent vs. 47 percent ≥ 3 times per week, during vs. before the SMC, respectively).
- Fewer students incorporated sprint or interval training into their personal PT program (46 percent vs. 59 percent ≥ 1 time per week, during vs. before the SMC, respectively).
- More students reported incorporating cross-training and/or off-the-shelf physical training programs into their personal PT programs during the SMC as compared to before the SMC.

Appendices G and H provide summaries of additional survey responses to questions concerning tobacco use and dietary habits. Detailed injury information captured by survey (for example, limited duty days, mechanism and activity associated with injury, permanent profiles, and injury impact) are presented in Appendix I.

Table 4. Tobacco Use and Personal PT Activities Before and During the Sergeants Major Course, Class 64 (n=406)

Variable	Categories	Before the SMC (Initial survey) n (%)	During the SMC (Follow-up survey) n (%)	Chi-square, initial vs. follow-up
Cigarette use ^a	Yes No	32 (8) 374 (92)	35 (9) 371 (91)	0.70
Smokeless tobacco use ^b	Yes No	54 (13) 352 (87)	47 (12) 359 (88)	0.46
Personal PT				
Perform PT on own time	Yes No	397 (99) 6 (1)	398 (99) 4 (1)	0.53
Frequency of distance running	No distance running 1-2 times per week 3-4 times per week ≥ 5 times per week	40 (10) 91 (23) 207 (52) 59 (15)	58 (14) 87 (22) 213 (54) 40 (10)	0.07
How far run when perform distance running	1-2 miles per week 3-4 miles per week ≥ 5 miles per week	66 (18) 238 (67) 53 (15)	62 (18) 226 (66) 52 (15)	0.99
Total miles per week (calculated)	No distance running <5 miles per week	40 (10) 46 (12)	58 (14) 39 (10)	0.37

Technical Report No. S.0023113-14, Aug 2013–May 2014

Variable	Categories	Before the SMC (Initial survey) n (%)	During the SMC (Follow-up survey) n (%)	Chi-square, initial vs. follow-up
	5-9 miles per week 10-19 miles per week ≥20 miles per week	147 (37) 120 (30) 44 (11)	139 (35) 115 (29) 47 (12)	
Frequency of aerobic endurance training that did NOT involve running	No aerobic endurance 1-2 time per week 3-4 times per week ≥5 times per week	100 (25) 180 (45) 88 (22) 29 (7)	88 (22) 138 (35) 139 (35) 33 (8)	<0.01
Duration of aerobic endurance training that did NOT involve running	30 minutes or less per session 31-60 minutes per session 1 hour or more per session	95 (32) 179 (60) 23 (8)	98 (32) 192 (62) 20 (6)	0.81
Frequency of resistance training	No resistance training 1-2 times per week 3-4 times per week ≥5 times per week	66 (17) 143 (36) 136 (34) 52 (13)	89 (22) 94 (24) 150 (38) 65 (16)	<0.01
Frequency of sprint or interval training	No sprint/interval running 1-2 times per week ≥3 times per week	161 (41) 223 (56) 13 (3)	215 (54) 159 (40) 24 (6)	<0.01
Duration of resistance training	30 minutes or less per session 31-60 minutes per session 1 hour or more per session	95 (29) 214 (65) 22 (7)	91 (29) 190 (62) 28 (9)	0.48
Personal PT program based on (multiple responses allowed)	Traditional Army PT Cross-training type TRX® Power 90 Extreme® Crossfit® Mission Essential Fitness ^c Insanity® Other No Specific Program	129(32) 57 (14) 20 (5) 15 (4) 41 (10) 14 (4) 21 (5) 18 (5) 98 (25)	133 (33) 69 (17) 31 (8) 19 (5) 72 (18) 23 (6) 27 (7) 53 (13) --	0.02

Notes:

^aCigarette Use was defined as an individual who had smoked 100 cigarettes in their lifetime and had smoked in the last 30 days.

^bSmokeless Tobacco Use was defined as an individual who had used smokeless tobacco products in the last 30 days.

^c A PT program developed specifically at Ft Bliss.

6.1.4 Physical Therapy Use During the Sergeants Major Course

The follow-up survey contained a series of questions about the use of the SMC physical therapist. A summary of responses is below (Table 5). Approximately half (48 percent) of survey respondents saw the SMC physical therapist. Of those who did not, the majority (79 percent) were not injured. Among those who saw the SMC physical therapist, 46 percent said they would not have seen her if she was not co-located at the school. Nearly all (96 percent) said they would recommend visiting the SMC physical therapist to their classmates or students in the next class.

Table 5. Use of Physical Therapist During the Sergeants Major Course, Class 64 (All Follow-up Survey Respondents, n=453)

Variable	Categories	n (%)
Saw the SMC physical therapist	Yes, for an injury sustained during the SMC	43 (10)
	Yes, for an injury sustained prior to the SMC	142 (31)
	Yes, for both a new & prior injury	33 (7)
	No	231 (51)
	Not Answered	4 (<1)
Among those who did not see the SMC Physical Therapist (n=231)		
Why did you NOT see the SMC physical therapist this school year?	Not Injured	147 (79)
	Didn't think she could help me	28 (12)
	Appointment availability conflict	21 (9)
	Recovered on own	15 (6)
	Other medical care obtained	14 (6)
	Other	6 (3)
Among those who saw the SMC Physical Therapist (n=218)		
If not co-located, would you see the SMC physical therapist?	Yes	117 (54)
	No	100 (46)
Would you recommend the SMC physical therapist to your classmates?	Yes	210 (96)
	No	8 (4)

6.2 Medical Records Analysis: Injury Rates, Injury Types, and Clinic Use

The demographic data available from the medical records for both Class 64 and Class 63 are shown in Table 6. (Note: To enable the most complete comparison possible, medical records analysis was not limited to the evaluation sample, that is, those who took both surveys.)

The classes were similar with regard to the distributions of gender, age, race, marital status, Service, Component, and APFT pass rate. The prior class had a lower proportion of students with some college or more (56 percent vs. 77 percent, Class 63 and 64, respectively). Unfortunately, final APFT data were not available for the Class 63, so comparisons of changes in fitness during SMC between classes could not be made.

Table 6. Demographics from Electronic Medical Records: Sergeants Major Course Class 64 vs. Class 63

Variable	Categories	Class 63 (n=607) n (%)	Class 64 (n=486) n (%)	Chi-square p-value
Gender	Male Female	543 (90) 64 (11)	431 (89) 55 (11)	0.68
Age	≤40 41-43 ≥44	197 (32) 191 (31) 219 (36)	170 (35) 160 (33) 156 (32)	0.38
Race	White Black Other	261 (43) 227 (37) 119 (20)	237 (49) 175 (36) 74 (15)	0.08
Marital status	Single Married Other	24 (4) 526 (87) 57 (9)	16 (3) 417 (86) 53 (11)	0.62
Education level	High school or equiv. Some College Bachelor's Master's or above Unknown	272 (45) 145 (24) 143 (24) 40 (7) 7 (1)	109 (22) 201 (41) 142 (29) 30 (6) 4 (1)	<0.01
Service	Air Force Army Coast Guard Marines International	3 (1) 594 (98) 4 (1) 6 (1) 0	2 (<1) 475 (98) 3 (1) 6 (1) 0	0.98
Component	Active Duty National Guard Reserve	527 (87) 20 (3) 60 (10)	429 (88) 10 (2) 47 (10)	0.45
APFT Pass (Initial)	Yes No	592 (98) 14 (2)	376 (98) 9 (2)	0.98

6.2.1 Incidence of Reported Injuries

On average, in Class 64, 69.5 percent of students had a medical visit for an injury during the ten-month SMC (Table 7), for an average rate of 6.95 students treated for injury per 100 students per month. This includes care sought for existing and new injuries. Lower extremity overuse injuries accounted for 82 percent of all reported injuries. In this class, the incidence of reported injury during the SMC was statistically significantly higher than the incidence prior to the SMC (69.5 vs. 61.1 percent injured, $p < 0.01$, risk ratio and 95 percent confidence interval=1.14 (1.04, 1.25)).

Table 7 also presents injury incidence for a comparison (prior) class, Class 63. The incidence of injuries for which treatment was sought prior to the SMC was statistically similar for these classes (61.1 vs. 58.6 percent, $p = 0.41$). The proportion reporting an injury in Class 64 was slightly higher than Class 63, with borderline statistical significance (69.5 vs. 64.2 percent, $p = 0.07$). Reported lower extremity injury was statistically significantly higher in Class 64 (57.4 vs. 50.4 percent, $p = 0.02$).

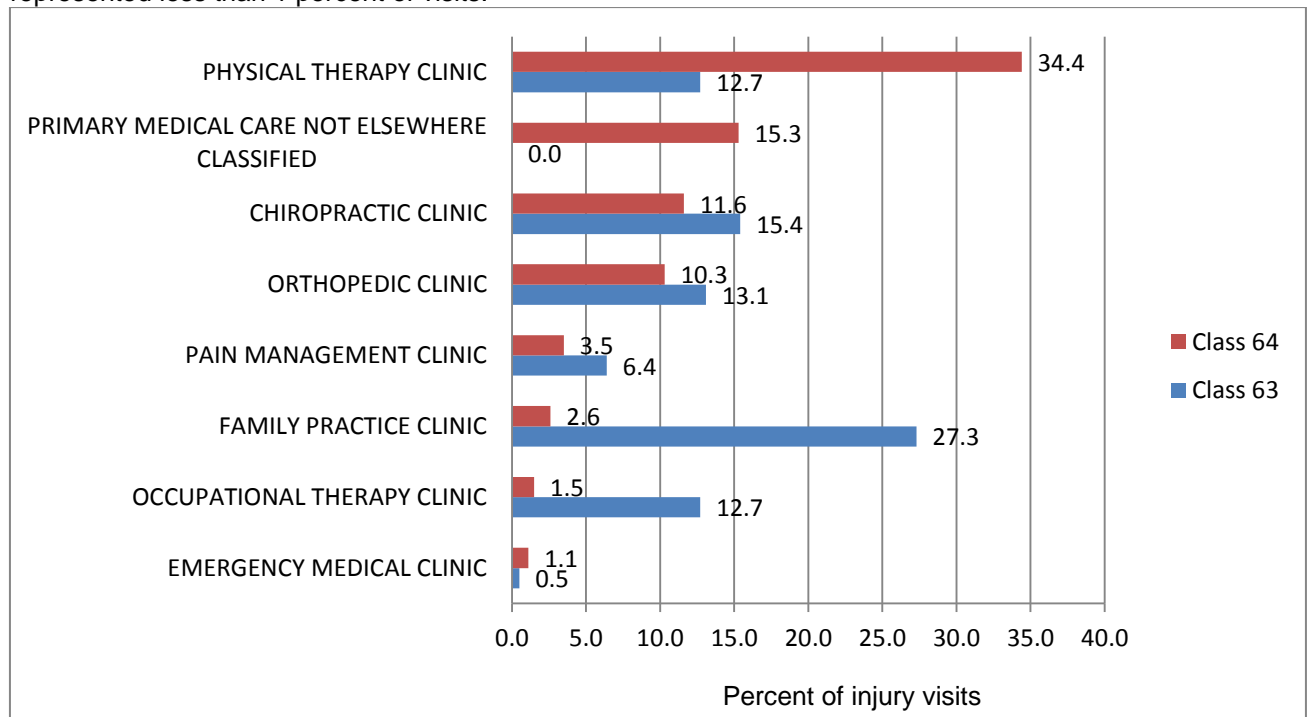
Table 7. Incidence of Reported Injuries Prior to and During the Sergeants Major Course, Class 64 vs. Class 63

Class and injury definition	Injury incidence (%), Class 64 (n=486)	Injury incidence (%), Class 63 (n=607)	Risk ratio (95% confidence interval)	Chi-square p-value
During the SMC, Comprehensive Injury Index (CII)	69.5	64.3	1.08 (0.99, 1.18)	0.07
During the SMC, Installation Injury Index (III)	67.5	61.4	1.10 (1.01, 1.20)	0.04
During the SMC, Lower extremity overuse injury (TRII)	57.4	50.4	1.17 (1.02, 1.34)	0.02
1 year prior to the SMC (CII)	61.1	58.6	1.11 (0.87, 1.41)	0.41

CII=Comprehensive Injury Index (all injuries, expanded definition); III=Installation Injury Index (all injuries, surveillance definition); TRII=Training-related Injury Index (lower extremity overuse injuries)

6.2.2 Clinic Use

Figure 1 indicates there was a greater proportion of injuries treated by the Physical Therapy Clinic in Class 64 compared to Class 63: 34 percent versus 13 percent, respectively. In the prior class, the Family Practice Clinic treated the greatest percent of injuries, over 25 percent. Other clinics not presented, such as emergency medicine, rheumatology, and neurosurgery, treated injuries as well but represented less than 1 percent of visits.



Notes: n=2,229 injury (CII) visits during the SMC among 607 students in Class 63; n=1,752 injury (CII) visits during the SMC among 486 students in Class 64.

Figure 1. Proportion of Injuries Treated by Clinic During the Sergeants Major Course, Class 64 vs. Class 63

6.2.3 Injury Types

Over eighty percent of all injury visits for Class 64 (n=1,439) could be classified in the Barell matrix or injury-related musculoskeletal matrix. Remaining codes were primarily (94 percent) ICD-9-CM codes in the 710-739 range that are not part of either matrix.

Table 8 indicates that the leading traumatic injuries treated during the SMC for Class 64 were sprains and strains (50.6 percent), fractures (16.9 percent), and dislocations (10.2 percent). Leading body regions affected were the lower extremity (54.8 percent) and upper extremity (13.9 percent).

Table 9 shows that the leading injury-related musculoskeletal treated during the SMC for Class 64 were related to inflammation and pain (67.0 percent). Leading body regions affected by injury-related musculoskeletal conditions were the spine and back (42.4 percent) and lower extremity (34.3 percent). Distributions were similar for analyses completed with incident visits (data not shown).

Table 8. Injury Visits by Diagnosis and Body Region (Barell Matrix) for Acute Injuries during the Sergeants Major Course, Class 64

				Diagnosis																
				Fracture	Dislocation	Sprain/Strain	Internal	Open Wound	Amputations	Blood Vessel	Contusion/Superficial	Crush	Burns	Nerves	Unspecified	System-wide & late effects	Total	%	% by Body Region	
Body Region	Head and Neck	Traumatic Brain Injury (TBI)	Type 1 TBI	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0.6	3.0	
			Type 2 TBI	0	0	0	4	0	0	0	0	0	0	0	0	0	4	2.4		
			Type 3 TBI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0		
		Other Head, Face, Neck	Other head	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0.6	5.4	
			Face	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0.6		
			Eye	0	0	0	0	0	0	0	5	0	0	0	0	0	5	3.0		
			Neck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0		
			Head, Face, Neck Unspec.	0	0	0	0	0	0	0	2	0	0	0	0	0	2	1.2		
		Spine and Back	Spinal Cord (SCI)	Cervical SCI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
	Thoracic/Dorsal SCI			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0		
	Lumbar SCI			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0		
	Sacrum Coccyx SCI			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0		
	Spine, Back Unspec. SCI			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0		
	Vertebral Column (VCI)		Cervical VCI	0	0	2	0	0	0	0	0	0	0	0	0	0	2	1.2	7.8	
			Thoracic/Dorsal VCI	0	0	2	0	0	0	0	0	0	0	0	0	0	2	1.2		
			Lumbar VCI	0	0	9	0	0	0	0	0	0	0	0	0	0	9	5.4		
			Sacrum Coccyx VCI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0		
			Spine, Back Unspec. VCI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0		
	Torso		Torso	Chest (thorax)	1	0	1	0	0	0	0	1	0	0	0	0	0	3	1.8	6.6
				Abdomen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	

Technical Report No. S.0023113-14, Aug 2013–May 2014

			Diagnosis															
			Fracture	Dislocation	Sprain/Strain	Internal	Open Wound	Amputations	Blood Vessel	Contusion/Superficial	Crush	Burns	Nerves	Unspecified	System-wide & late effects	Total	%	% by Body Region
Unclass. by Site		Pelvis, Urogenital	0	0	5	0	0	0	0	0	0	0	0	0	0	5	3.0	
		Trunk	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1.2	
		Back, Buttock	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0.6	
	Extremities	Upper	Shoulder, Upper Arm	1	0	5	0	0	0	0	0	0	0	1	0	7	4.2	13.9
			Forearm, Elbow	10	0	1	0	0	0	0	0	0	0	0	0	11	6.6	
			Wrist, Hand, Fingers	0	0	2	0	2	0	0	0	0	0	0	0	4	2.4	
			Other & Unspec.	0	0	0	0	0	0	0	0	0	1	0	0	1	0.6	
		Lower	Hip	0	0	24	0	0	0	0	0	0	0	0	0	24	14.5	54.8
			Upper leg, Thigh	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
			Knee	0	17	0	0	0	0	0	0	0	0	0	0	17	10.2	
			Lower leg, Ankle	16	0	16	0	0	0	0	0	0	0	0	0	32	19.3	
			Foot, toes	0	0	2	0	3	0	0	1	1	0	0	0	7	4.2	
			Other & Unspec.	0	0	7	0	2	0	0	0	0	0	2	0	11	6.6	
		Other, Unspecified	Other/Multiple	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	7.2
			Unspec. Site	0	0	7	0	0	0	1	0	3	1	0	0	12	7.2	
		System-wide & late effects		0	0	0	0	0	0	0	0	0	0	0	2	2	1.2	1.2
	Total			28	17	84	5	8	0	0	10	1	3	2	6	2	166	100.0
	Percent			16.9	10.2	50.6	3.0	4.8	0.0	0.0	6.0	0.6	1.8	1.2	3.6	1.2	100.0	

Table 9. Injury Visits by Diagnosis and Body Region for Injury-related Musculoskeletal Injuries during the Sergeants Major Course, Class 64

				Diagnosis								
				Inflammation and Pain (Overuse)	Joint Derangement	Joint Derangement with Neurological	Stress Fracture	Sprains/Strains/Rupture	Dislocation	Total	%	% by Body Region
Body Region	Spine and Back	Vertebral Column (VCI)	Cervical VCI	72	24	18	0	0	0	114	9.0	42.4
			Thoracic/Dorsal VCI	0	16	23	0	0	0	39	3.1	
			Lumbar VCI	0	4	264	0	0	0	268	21.1	
			Sacrum Coccyx VCI	48	0	0	0	0	48	3.8		
			Spine, Back Unspec. VCI	35	36	0	0	0	71	5.6		
	Extremities	Upper	Shoulder	207	2	0		2	0	211	16.6	20.0
			Upper Arm, Elbow	27	0	0	0	0	0	27	2.1	
			Forearm, Wrist	11	0	0	0	0	0	11	0.9	
			Hand	6	0	0		0	0	6	0.5	
		Lower	Pelvis, Hip, Thigh	56	0	0	0	0	0	56	4.4	34.3
			Lower leg, Knee	235	19	0	1	7	0	262	20.6	
			Ankle, Foot	117	2	0	0	0	0	119	9.3	
	Unclass. by Site	Other, Unspecified	Other specified/Multiple	8	0	0	0	0	0	8	0.6	3.2
				31	0	1	1	0	0	33	2.6	
Unspecified Site												
			Total	853	103	306	2	9	0	1273		
			Percent	67.0	8.1	24.0	0.2	0.7	0.0		100.0	100.0

6.3 Factors Associated with Reported Injury during the Sergeants Major Course

Analysis of factors associated with injuries for which care was sought during the SMC was conducted for males only due to the small number of women in the SMC Class 64 (n=55) whose data resulted in very small sample sizes and unstable estimates for certain variables. Variables used in the analysis were obtained from the electronic medical records (demographics and injury) and the initial survey (health risk behaviors and APFT results prior to the SMC). Continuous data (body fat, APFT performance) were divided into tertiles based on male results only.

Table 10 shows the association of demographics, physical fitness, prior injury, and personal PT activities with the risk for one or more injury visits for male students during the SMC. The following variables were statistically significantly ($p \leq 0.10$) associated with reported injury in the univariate analysis: body fat greater than 24.7%, lower cardiorespiratory endurance as measured by 2 mile run time, and injury in the 12 months prior to the SMC. In addition, students who did not include other aerobic endurance training as part of their personal PT program had a 41% lower risk of reported injury compared to those who utilized alternative aerobic training activities. A multivariable model found APFT run time performance and injury in the 12 months prior to the SMC to be statistically significant predictors of reported injury during the SMC ($p \leq 0.05$). Table 11 shows the results for the final model. Those male students with the lowest cardiorespiratory endurance had a 2.7 times greater likelihood of seeking injury treatment compared to those with the highest cardiorespiratory endurance. Students injured in the 12 months prior to SMC were 1.9 times as likely as those who were not injured to seek treatment for an injury during SMC.

Table 12 shows the association of demographics, physical fitness, prior injury, and personal PT activities with the risk for one or more lower extremity (LE) overuse injury visits for male students during the SMC. The following variables were statistically significantly ($p \leq 0.10$) associated with LE overuse injury in the univariate analysis: Hispanic ethnicity, body fat greater than 24.7%, lower cardiorespiratory endurance as measured by 2 mile run time, performance in the two tertiles of lowest APFT sit-up results, injury in the 12 months prior to the SMC, and a personal PT program that did not include sprint training. A multiple regression model (Table 13) indicated that male students in the lowest levels of cardiorespiratory endurance were 1.9 times more likely to have sought care for an injury compared to males in the fastest tertile. Male students who were injured in the 12 months prior to the SMC had a 78% greater likelihood of seeking injury treatment during the SMC compared to those who were not injured prior to the SMC. In addition, male students who did not have a personal PT program that included sprint training had a 72% greater likelihood of reported injury during the SMC compared to those who included sprint training in their personal PT program one or more times per week. Supplemental analysis suggested that those who incorporated sprint training were slightly more fit (faster run times, completed more push-ups and sit-ups). Differences in performance were statistically significant for sit-ups and push-ups, but not 2 mile run time (Table 14).

Table 10. Association of Demographic, Physical Fitness, and Physical Activities with Any Injury Encounter during the Sergeants Major Course, Males, Class 64
(n=342 with medical records)

Variable	Categories	N	Injured (%)	Odds ratio (95%CI; p-value)	p-value overall
Age (years)	≤40	128	67	1.00	0.38
	41-43	111	72	1.26 (0.72-2.20; 0.41)	
	≥44	103	63	0.84 (0.48-1.44; 0.52)	
Race	White	191	65	1.00	0.67
	Black	103	69	1.20 (0.72-2.00; 0.49)	
	Hispanic	26	77	1.80 (0.69-4.70; 0.22)	
	Asian	6	83	2.70 (0.31-23.60; 0.35)	
	Other / Unknown	16	69	1.19 (0.40-3.56; 0.76)	
Marital status	Married	303	67	1.00	0.25
	Single	5	40	0.33 (0.05-2.00; 0.20)	
	Other	34	77	1.60 (0.70-3.66; 0.26)	
Education level	No High School	1	100	-----	0.84
	High school or equiv.	83	63	0.91 (0.49-1.67; 0.75)	
	< 4 years college	142	71	1.33 (0.76-2.31; 0.31)	
	Bachelor's	97	65	1.00	
	Master's or above	17	71	1.30 (0.42-3.98; 0.65)	
	Unknown	2	100	-----	
Current cigarette smoking	Yes	32	59	0.68 (0.32-1.43; 0.31)	0.31
	No	309	68	1.00	
Current smokeless tobacco use	Yes	127	69	1.03 (0.64-1.65; 0.91)	0.91
	No	212	68	1.00	
% Body Fat	22.77% or less	114	61	1.00	0.14
	22.78 – 24.71%	114	70	1.54 (0.89-2.66; 0.13)	
	24.72% or more	114	72	1.67 (0.96-2.91; 0.07)	
APFT 2 mile run time (tertiles)	Fastest (14.98 minutes or less)	93	57	1.00	0.02
	Moderate (14.99 to 16.23 minutes)	92	64	1.35 (0.75-2.44; 0.32)	
	Slowest (16.24 minutes or more)	92	77	2.55 (1.35-4.82; <0.01)	
APFT sit-ups (tertiles)	Lowest (56 repetitions or less)	105	70	1.44 (0.81-2.56; 0.22)	0.40
	Moderate (57 to 70 repetitions)	105	69	1.37 (0.77-2.44; 0.28)	
	Highest (71 repetitions or more)	101	61	1.00	
APFT push-ups (tertiles)	Lowest (50 repetitions or less)	110	70	1.40 (0.79-2.47; 0.25)	0.44
	Moderate (51 to 65 repetitions)	114	69	1.35 (0.77-2.38; 0.29)	
	Highest (66 repetitions or more)	104	63	1.00	
Injury in 12 months prior	Yes	113	76	1.86 (1.12-3.09; 0.02)	0.02
	No	228	63	1.00	

Variable	Categories	N	Injured (%)	Odds ratio (95%CI; p-value)	p-value overall
to the SMC					
Distance run for personal PT	≤ 6 miles per week 7-9 miles per week 10-15 miles per week 16+ miles per week	113 83 80 59	71 72 63 66	1.00 1.08 (0.57-2.02; 0.82) 0.69 (0.37-1.26; 0.23) 0.80 (0.41-1.58; 0.53)	0.51
Frequency of other aerobic endurance training for personal PT	Do not perform Perform ≥ 1 time per week	78 257	59 71	0.59 (0.35-1.00; 0.05) 1.00	0.05
Frequency of resistance training for personal PT	Do not perform Perform ≥ 1 time per week	47 288	62 69	0.72 (0.38-1.37; 0.32) 1.00	0.32
Frequency of sprint training for personal PT	Do not perform Perform ≥ 1 time per week	130 204	72 65	1.39 (0.86-2.25; 0.17) 1.00	0.17

Table 11. Predictors of Reported Injury during the Sergeants Major Course: Multiple Logistic Regression Results, Males, Class 64*

Variable	Categories	Odds ratio (95% CI)	p-value
APFT 2 Mile Run Time by tertiles	Fastest (14.98 minutes or less) Moderate (14.99 to 16.23 minutes) Slowest (16.24 minutes or more)	1.00 1.34 (0.73-2.45) 2.66 (1.39-5.10)	0.35 <0.01
Injury in 12 months prior to the SMC	Yes No	1.85 (1.06-3.23) 1.00	0.03
Frequency of other aerobic endurance training for personal PT	Do not perform Perform ≥ 1 time per week	0.60 (0.34-1.06) 1.00	0.08

Table 12. Association of Demographic, Physical Fitness, and Physical Activities with Lower Extremity Overuse Injury during the Sergeants Major Course, Males, Class 64 (n=342 with medical records)

Variable	Categories	N	Injured (%)	Odds ratio (95%CI; p-value)	p-value overall
Age (years)	≤40	128	55	1.00	0.45
	41-43	111	62	1.36 (0.81-2.29; 0.24)	
	≥44	103	55	1.03 (0.61-1.73; 0.92)	
Race	White	191	54	1.00	0.33
	Black	103	57	1.12 (0.69-1.82; 0.64)	
	Hispanic	26	73	2.27 (0.91-5.65; 0.07)	
	Asian	6	83	4.18 (0.48-36.48; 0.16)	
	Other / Unknown	16	56	1.08 (0.38-3.01; 0.89)	
Marital status	Married	303	56	1.00	0.34
	Single	5	40	0.51 (0.08-3.12; 0.46)	
	Other	34	68	1.61 (0.76-3.43; 0.21)	
Education level	No High School	1	100	-----	0.96
	High school or equiv.	83	54	0.98 (0.55-1.77; 0.95)	
	< 4 years college	142	60	1.24 (0.73-2.09; 0.42)	
	Bachelor's	97	55	1.00	
	Master's or above	17	59	1.19 (0.42-3.37; 0.75)	
	Unknown	2	100	-----	
Current cigarette smoking	Yes	32	47	0.63 (0.30-1.31; 0.22)	0.22
	No	309	58	1.00	
Current smokeless tobacco use	Yes	127	58	0.98 (0.63-1.53; 0.92)	0.92
	No	212	58	1.00	
% Body Fat	22.77% or less	114	50	1.00	0.14
	22.78 – 24.71%	114	60	1.48 (0.88-2.50; 0.14)	
	24.72% or more	114	62	1.65 (0. 97-2.80; 0.06)	
APFT 2 mile run time (tertiles)	Fastest (14.98 minutes or less)	93	50	1.00	0.09
	Moderate (14.99 to 16.23 minutes)	92	54	1.22 (0.68-2.17; 0.51)	
	Slowest (16.24 minutes or more)	92	65	1.92 (1.06-3.46; 0.03)	
APFT sit-ups (tertiles)	Lowest (56 repetitions or less)	105	60	1.59 (0.92-2.77; 0.10)	0.11
	Moderate (57 to 70 repetitions)	105	62	1.72 (0.99-3.00; 0.05)	
	Highest (71 repetitions or more)	101	49	1.00	
APFT push-ups (tertiles)	Lowest (50 repetitions or less)	110	63	1.44 (0.84-2.49; 0.19)	0.41
	Moderate (51 to 65 repetitions)	114	57	1.14 (0.67-1.94; 0.64)	
	Highest (66 repetitions or more)	104	54	1.00	
Injury in 12 months prior	Yes	113	66	1.68 (1.05-2.68; 0.03)	0.03
	No	228	53	1.00	

Variable	Categories	N	Injured (%)	Odds ratio (95%CI; p-value)	p-value overall
to the SMC					
Distance run per week for personal PT	≤ 6 miles per week	113	62	1.00	0.40
	7-9 miles per week	83	61	0.98 (0.55-1.75; 0.94)	
	10-15 miles per week	80	51	0.65 (0.36-1.15; 0.14)	
	16+ miles per week	59	54	0.73 (0.38-1.38; 0.33)	
Frequency of other aerobic endurance training for personal PT	Do not perform	78	50	0.67 (0.40-1.11; 0.12)	0.12
	Perform ≥ 1 time per week	257	60	1.00	
Frequency of resistance training for personal PT	Do not perform	47	57	0.99 (0.53-1.85; 0.98)	0.98
	Perform ≥ 1 time per week	288	58	1.00	
Frequency of sprint training for personal PT	Do not perform	130	65	1.62 (1.03-2.55; 0.04)	0.04
	Perform ≥ 1 time per week	204	53	1.00	

Table 13. Predictors of Reported Lower Extremity Overuse Injury during the Sergeants Major Course: Multiple Logistic Regression Results, Males, Class 64

Variable	Categories	Odds ratio (95% CI)	p-value
APFT 2 mile run time (tertiles)	Fastest (14.98 minutes or less)	1.00	0.76
	Moderate (14.99 to 16.23 minutes)	1.10 (0.60-2.01)	
	Slowest (16.24 minutes or more)	1.89 (1.03-3.49)	
Injury in 12 months prior to the SMC	Yes	1.78 (1.05-3.02)	0.03
	No	1.00	
Frequency of sprint training for personal PT	Do not perform	1.72 (1.01-2.94)	0.05
	Perform ≥ 1time per week	1.00	

Table 14. APFT Performance by Sprint Training Frequency during Personal Physical Training, Males, Class 64

	APFT 2 mile run time* (Mean minutes \pm standard deviation (SD))	APFT sit-ups [†] (Mean repetitions \pm SD)	APFT push-ups [†] (Mean repetitions \pm SD)
Do not perform sprint training for personal PT	15.82 \pm 1.31	61 \pm 14	57 \pm 14
Perform sprint training for personal PT \geq 1 time per week	15.48 \pm 1.56	65 \pm 14	60 \pm 14

*No statistically significant difference in performance between those who include sprint training and those who do not (t-test $p > 0.05$)

[†]Statistically significant difference in performance between those who include sprint training in their personal PT program compared to those who do not (t-test $p \leq 0.05$)

7 Discussion

In July 2013, a physical therapist was assigned to work with SMC students and provide injury treatment and injury prevention education to SMC students. This evaluation sought to (1) evaluate the effects of the physical therapist on injuries and physical fitness of SMC students and (2) assess risk factors for reported injury among the SMC students.

7.1 Injuries and Physical Fitness

With regard to physical fitness, this evaluation found limited physical fitness changes over the 10-month course in Class 64, the class assigned a physical therapist. Fitness gains may not have been a goal during SMC attendance; however it is notable that despite being in a school environment with classroom activities that are inherently inactive, the SMC students were able to maintain physical fitness (as measured by APFT performance) and body composition (as measured by BMI) during the SMC. This may be due to an overall healthy lifestyle. Survey responses indicated that 99 percent of students performed PT on their own time, only 9 percent were cigarette smokers, and 12 percent reported smokeless tobacco use.

With regard to injury, this evaluation found that in Class 64, the class assigned a physical therapist, more students sought medical treatment for injuries, in particular lower extremity overuse injuries. There was evidence that in both classes, the incidence of injury was lower prior to SMC attendance, a potential indication of avoidance of treatment given that students cannot enter the SMC with a temporary profile. Alternatively, the higher injury incidence during the SMC seen for both classes may indicate that students are generally more able to seek care during the SMC. Despite having a substantial course load, the lower physical demands during the SMC (for example, unit PT only once a week) may provide an opportunity to address chronic injuries. In addition, access to an on-site physical therapist may have reduced barriers to seeking care.

Early treatment of injuries is a goal. A study conducted using Military Health System data showed that early referral to physical therapy (within 14 days of the first visit for care), specifically for management of low back pain, resulted in lower utilization of advanced imaging, lumbar spinal injections, lumbar spine surgery, and use of opioids, and as a result substantial cost savings and enhanced patient well-being (Childs et al. 2015). Studies looking at Medicare and Medicaid data

and a national database of employer-sponsored health plans also showed decreased risk of surgery, lumbar spinal injections, and opioid use with early access to physical therapy for management of low back pain (Gellhorn et al. 2012; Fritz et al. 2012). In this population, 21 percent of reported injury-related musculoskeletal conditions were related to the low back. Though many of these cases may be pre-existing conditions, direct access to physical therapy care during the SMC and co-location of physical therapy offices with the SMC classrooms may have facilitated care that was previously harder to schedule.

The injury rate in this SMC class (6.95/100 students/month) includes visits for existing and new injuries. However, this rate is comparable to rates of new injuries seen in investigations of injuries among Army War College students conducted in 1999 and 2000 (7.3 injuries/100 students/month and 6.4 injuries/100 students/month, 1999 and 2000, respectively) (Knapik et al. 2002). At that time, the APFRI program was active at the War College and injuries due to intramural sports were of particular concern. A study of injuries and illnesses among the 1995-1996 SMC class reported 5.2 injuries/100 students/month (Cosio-Lima et al. 2013), a rate lower than Class 64. However, the Cosio-Lima study reported data only from injuries that occurred during SMC physical fitness training.

Leading injury types receiving treatment in the 2013 class with a physical therapist (Class 64) were sprains/strains (50.6 percent of acute injuries) and pain (67.0 percent of musculoskeletal conditions), compared to leading injury types in the 1995 class (sprain/strain 36.4 percent; pain 29.5 percent of all injuries), which were lower. As with the 1995 class, a leading body region for Class 64 injuries was the lower extremity (55 percent of all injuries in the 1995 class; 55 percent of acute injuries and 34 percent of overuse injuries in Class 64). A high proportion of Class 64 visits were associated with the spine and back (42 percent of all overuse, or injury-related musculoskeletal conditions) as well, whereas only 15.5 percent of class 1995 injuries affected the back. This finding in SMC Class 64 coincides with reports citing a high proportion of low back injuries among Soldiers in deployed environments (Cohen et al. 2005; Roy 2012; Rhon 2010). Although the survey did not capture deployment information, the SMC students in Class 64 likely deployed one or more times given their rank and that, as of 2011, nearly 73 percent of active component Soldiers had deployed (Baiocchi 2013).

7.2 PT Activities

Survey data was used to assess changes in the following personal PT activities: distance running, aerobic endurance training that did not involve running, resistance training, and sprint or interval training. There were small changes in reported distance running, with slightly more students reporting that distance running was not a part of their personal PT program during the SMC than prior to the SMC and fewer students running 5 or more miles per week. Rather, it appears they were substituting other activities, such as other aerobic training (for example, elliptical machine, rowing machine, or cycling) and resistance training. This represents an important change that may reduce injury risk, given that injury risk typically increases with increased running mileage (Koplan et al. 1982; Jones 1994; Fields 2011). There is also growing evidence suggesting that a training program incorporating both resistance and endurance training results in higher strength and aerobic performance than endurance training alone (Wilson et al. 2012). It is not clear if changes seen in Class 64 were precipitated by education provided by the physical therapist, by other factors such as the SMC class schedule or facilities, or a combination of both.

In addition, the proportion of students reporting participation in cross-training and off-the-shelf physical training programs as part of their personal PT increased during the SMC. The incorporation of cross-training is likely beneficial, as noted above. Cross-training has also been shown to have benefits related to muscle endurance among female Soldiers (Grier et al. 2015).

However, some of the off-the-shelf programs may be considered extreme conditioning programs, defined as “high-volume aggressive training workouts that use a variety of high intensity exercises and often timed maximal number of repetitions with short rest periods between sets” (Bergeron et al. 2011). Concerns about the effects of such programs have been expressed (Bergeron et al. 2011). To date, there remains few studies of injury risk and extreme conditioning programs; the majority are injury case reports of conditions such as rhabdomyolysis and carotid artery dissections (Knapik, 2015). One study of an Army unit with Soldiers who participated in a program that incorporated elements of extreme conditioning found similar increases in injury rates among Soldiers not participating in the program, so no recommendations for or against the program could be made (Grier et al. 2013).

A reported decrease in sprint or interval training suggests that SMC students would benefit from additional instruction on the advantages and methods for incorporating this component of PRT into their personal PT program. Sprint and interval training is a recommended component of Army Physical Readiness Training (PRT) that facilitates cross-training and reduces risk of overtraining (DA 2012) and has been shown to improve aerobic endurance (Burgomaster et al. 2005).

7.3 Physical Therapy Use

Clinic use data indicated that injuries were more commonly treated by physical therapy in Class 64, the class assigned a physical therapist, suggesting that specialized injury care was being sought. A possible reason was the co-location and assignment of a physical therapist to this SMC class; survey data confirmed that nearly half of all SMC students in Class 64 had seen the SMC physical therapist. However, other unmeasured factors (e.g., precise physical activity levels, new medical or physical training policies) could not be ruled out.

The value of co-locating the physical therapist with students was evident from survey responses, given 46 percent of those who had seen the physical therapist stated they would not have sought physical therapist care if she had not been co-located at the school. Not only does the close proximity to the school enhance access to care for the students, but it likely also facilitates contact with school administration and faculty. In a systematic review of workplace-based return-to-work interventions, strong evidence existed in support of interventions involving contact between healthcare providers and the workplace (Franché et al. 2005). For example, policies and programs that establish a formal framework for interaction between healthcare providers and the employer with regard to low back pain management have demonstrated favorable outcomes such as fewer days on sick leave, stable health status, and maintenance of ability to work 1-year post-intervention (Loisel et al. 2003; Karjalainen et al. 2003). In addition, a Cochrane review of back schools administered by medical providers indicated that they were effective for those with chronic or recurrent low back pain if linked with the workplace (Heymans et al. 2005). A second review of multidisciplinary interventions addressing back pain showed improvement in return to work only if the intervention included visits to the workplace (Karjalainen et al. 2001). A randomized controlled trial of an intervention to address subacute low back pain in the workplace supported the effectiveness of consultation with a specialist who provided an examination and opportunity for questions, discussed working conditions, and recommended specific evidence-based exercises to restore function. Among persons who received the intervention, daily pain was less common, satisfaction was higher, and sick leave use was lower (Karjalainen 2003). This evidence suggests that links between healthcare and the workplace are essential to workplace injury and disability prevention.

Nearly all (96 percent) of those who visited the SMC physical therapist said they would recommend visiting the SMC physical therapist to their classmates. This response indicates high satisfaction

with care and suggests that the program and education currently in use are meaningful and worthwhile.

Input from the SMC physical therapist cited the following advantages and accomplishments of the program:

- (1) Co-location of offices with the SMC students and staff;
- (2) Assignment to the Preventive Medicine Department, a department that is not driven by direct patient care and the generation of relative value units (RVUs) and thus provides greater flexibility to focus on prevention and physical performance optimization activities;
- (3) Implementation of a Train the Trainer course with SMC cadre; and
- (4) Establishment of informal relationships with SMC leadership and students by attendance at SMC leadership meetings, morning physical training with the students, and other class events.

There were unmeasured effects of the program; for example, the informal relationships with SMC leadership that resulted in an invitation for the SMC physical therapist to comment on the SMC curriculum. This invitation represents a valuable opportunity, since injury prevention, physical performance optimization, and injury rehabilitation management education are currently lacking in Army leadership schools. Inclusion of information such as reconditioning PRT for recently, currently, and permanently profiled Soldiers, and effective use of Army PRT to avoid over-training and injury would be invaluable. Continued efforts are needed to pursue modification of the SMC curriculum so that science-based injury prevention and physical performance optimization education is institutionalized and available to current and future NCO leaders who directly manage Soldier activities. Further study is needed to assess knowledge change as a result of this education, as well as second and third order effects of such education on the future health and performance of these leaders, and the health and performance of their Soldiers.

7.4 Factors Associated with Reported Injury

Analysis of factors associated with injuries for which care was sought during the SMC was conducted for male students only due to the small number of women in the SMC Class 64 (n=55). Factors associated with reported injury included aerobic fitness, as measured by APFT run time performance, and injury in the 12 months prior to the SMC; both were statistically significant predictors of seeking treatment for injury and LE overuse injury during the SMC. This result is not surprising, given that 2-mile run time is consistently associated with injury risk in basic combat training (Knapik et al. 2006) and other Army populations (Grier et al. 2011). When it has been measured, prior injury has also been an injury risk factor in certain Army populations (Jones et al. 1993; Grier et al. 2011), but not all (Henderson et al. 2000). Prior injury was a predictor of injury in a prior investigation of injuries among Army War College students (USACHPPM 2000) and Command and General Staff College students (APHC 2015).

More surprising, perhaps, is the lack of association of injury risk with risk factors that have been seen in other Army populations, such as gender, age, and cigarette smoking (Knapik et al. 2006). However, a prior study of SMA students showed a similar result; no independent risk factors for injuries were identified in a study of injuries and illnesses among the 1995 SMA class, though age, BMI, physical fitness, alcohol use, and cigarette smoking were considered (Cosio-Lima et al. 2013).

An additional statistically significant risk factor for lower extremity overuse injury during the SMC was having a personal PT program that did not include sprint training. As discussed above, sprint and interval training is a recommended component of Army PRT that facilitates cross-training and reduces risk of overtraining (DA 2012), while improving aerobic endurance (Burgomaster et al. 2005). Those who do not include sprint training may also be less knowledgeable of other physical training and injury prevention principles, contributing to a higher injury risk, but this could not be assessed with available data. Those that did not include sprint training appeared to be slightly less physically fit, which may have contributed to higher injury risk.

8 Conclusions

This evaluation found that more SMC students sought treatment for injuries, in particular lower extremity overuse injuries, in Class 64 compared to a prior class (Class 63) that was similar in age, gender distribution, APFT pass rate, and prior injury incidence. Class 64 had a physical therapist assigned to serve the SMC students and clinic use data indicated that injuries were more commonly treated by physical therapy in Class 64 compared to Class 63. Survey data confirmed interactions with the physical therapist were occurring as well; nearly half of all Class 64 students had been evaluated and treated by the SMC physical therapist. The presence of the physical therapist may have resulted in higher reported injury incidence due to increased care-seeking behavior facilitated by access to timely, on-site physical therapy care, in particular for lower extremity overuse injuries. Increased interaction with the physical therapist could be beneficial, given the improved health outcomes demonstrated in prior studies of programs linking healthcare providers with the workplace. However, it is not possible to rule out the effects of other unmeasured factors on injury incidence among Class 64 students (e.g., physical activity levels, new medical treatment or physical training policies).

With regard to physical fitness, cardiorespiratory endurance and body composition did not change in the SMC class with a physical therapist (Class 64), while muscular endurance improved slightly. It is notable that despite being in a school environment with classroom activities that are inherently inactive, the SMC students were able to maintain physical fitness (as measured by APFT performance) and BMI during the SMC. However, these results cannot be directly attributed to the presence of the physical therapist.

Other observations included that injury incidence was lower prior to SMC attendance in both classes, a potential indication of avoidance of treatment given that students cannot enter the SMC with a temporary profile. In addition, the higher injury incidence during the SMC seen for both classes may indicate that students generally choose to seek care during the SMC. Despite having a substantial course load, the lower physical demands during the SMC (for example, unit physical training once a week) may provide an opportunity to address chronic injuries.

There were a number of important lessons learned about the program. The value of co-locating the physical therapist with students was evident from survey responses showing that 46 percent of those who had seen the physical therapist stated they would not have sought physical therapy care if she had not been co-located at the school. Nearly all (96 percent) of those who visited the SMC physical therapist said they would recommend visiting the SMC physical therapist to their classmates.

9 Recommendations

Based on this evaluation of the short-term effects on injury and fitness, we cannot definitively recommend for or against the placement of a physical therapist at the SMC. Future evaluations

would benefit from pre- and post-implementation measurement of additional factors contributing to injury risk in a comparison population, such as a survey that would capture physical activity levels and APFT performance. Documentation of the program elements and collection of process metrics, such as changes in physical fitness or injury prevention knowledge following injury prevention education activities, would also assist with understanding the exact outcomes that would be expected to be influenced by the presence of the physical therapist. In addition, use of qualitative methods could assist with identifying or ruling out factors, such as policy changes, that can influence outcomes such as injury incidence and identifying other effects, such as Command perceptions of care and effects on unit cohesion.

Further study of long-term effects on the future health and performance (e.g., recurrence of injury, disability) of these non-commissioned officer (NCO) leaders, and the health and performance of their Soldiers, is needed. In addition, while injury and physical fitness are key outcomes to assess, future evaluations should consider analyses of cost savings and collecting additional measures such as Soldier functional status, time to return to functional status, and quality of life. Other measures to consider include general physical health, mental health, quality of work life, and medication use (Franche et al. 2005).

10 Point of Contact

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Appendix A

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Appendix B

Sergeants Major Course (SMC) Class 64 Initial Survey

PRIVACY ACT STATEMENT – HEALTH CARE RECORDS, FITNESS TEST SCORES, AND QUESTIONNAIRE	
1. AUTHORITY FOR COLLECTION OF INFORMATION INCLUDING SOCIAL SECURITY NUMBER	
Public Law 104-191, Section 1178; Executive Order 9397; Section 8103, Title 5, United States Code	
2. PRINCIPLE PURPOSES FOR WHICH INFORMATION IS INTENDED TO BE USED	
<p>This form provides you the advice required by the Privacy Act of 1974. The information obtained from this project will be used to determine if cross-training types of physical fitness programs have an effect on injuries, limited duty days, and physical fitness. We will need to obtain your social security number in order to link your questionnaire information with other data such as Army Physical Fitness Test (APFT) scores and information on injuries you may have had in the last year. Using your social security number is the only way we can do this. We will strictly limit access to your social security number by shredding all paper files after scanning, having all computer files password protected, and removing SSNs and name after data are linked. The questionnaire is to obtain information on current physical fitness activities, tobacco use, dietary habits and previous or current injuries.</p>	
3. ROUTINE USES	
<p>The primary use of this information is to improve the health of those attending the Sergeant Major (SGM) Course. The data obtained from the questionnaires will be included in a database that contains the same information for all Soldiers participating in this project. The only personnel having access to this information will be the public health officials who will analyze the information. You will not be personally identified in any report or any output of any type since the interest is in the health and fitness of the Unit and not the health and fitness of any single individual.</p> <p>The database that is established will identify current level of fitness and factors that lower Soldiers' risk of injury and enhance fitness. The database will be used to make recommendations to decision makers regarding programs and policies that might improve fitness and reduce the incidence of injury.</p>	
4. WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION	
<p>Disclosure of the requested information is voluntary. If you do not disclose the information you will not be included in the database and you will not participate in the project designed to reduce injuries and improve the health and fitness of Soldiers.</p>	
SIGNATURE OF PARTICIPANT	DATE

SGM Course at Fort Bliss (August 2013) Initial Survey on Injuries, Fitness, Tobacco Use and Nutrition

Background Details

Directions: Please carefully read the directions for each section. Be sure to darken bubbles completely. Do not use checks or “x’s or special characters” to fill in the bubbles. Please be sure to write legibly where a written answer is required.

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Technical Report No. S.0023113-14, Aug 2013–May 2014

Background Details

1. Today's date:

Month	<input type="radio"/> Jan	<input type="radio"/> Feb	<input type="radio"/> Mar	<input type="radio"/> Apr	<input type="radio"/> May	<input type="radio"/> Jun	<input type="radio"/> Jul	<input type="radio"/> Aug	<input type="radio"/> Sep	<input type="radio"/> Oct	<input type="radio"/> Nov	<input type="radio"/> Dec
Day	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="radio"/> 10	<input type="radio"/> 11	<input type="radio"/> 12
	<input type="radio"/> 13	<input type="radio"/> 14	<input type="radio"/> 15	<input type="radio"/> 16	<input type="radio"/> 17	<input type="radio"/> 18	<input type="radio"/> 19	<input type="radio"/> 20	<input type="radio"/> 21	<input type="radio"/> 22	<input type="radio"/> 23	<input type="radio"/> 24
	<input type="radio"/> 25	<input type="radio"/> 26	<input type="radio"/> 27	<input type="radio"/> 28	<input type="radio"/> 29	<input type="radio"/> 30	<input type="radio"/> 31					

2. Are you...

- ☐ ₀ Male
☐ ₁ Female

3. What Service are you in?

- ☐ ₁ Army
☐ ₂ Air Force
☐ ₃ Coast Guard
☐ ₄ International
☐ ₅ Marines
☐ ₆ Navy
☐ ₇ Other, please specify _____

4. What is your component?

- ☐ ₀ Regular Active Duty
☐ ₁ Reservist
☐ ₂ National Guard

5. What is your U.S. Army Military Occupational Specialty (MOS)?

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If not in the U.S. Army, please specify your military specialty _____

Injuries

The next questions are about injuries that you have experienced. People can be injured accidentally or on purpose. Injuries can occur in two ways:

- 1) When strong sudden forces are applied to the body – these would include things like falling from a ladder, an automobile crash, or being hit by a bullet fired from a weapon. Such forces result in **acute or traumatic injuries**.
- 2) When smaller forces are applied to the body over and over again (repeatedly) – these would include activities like excessive exercise or running long distances, repetitive lifting/pulling/pushing objects, or repeatedly pitching a softball. Such forces result in **overuse or chronic injury**

With the above definitions in mind, please complete the next 3 pages to identify the following injuries:

Injury page #1: The **most recent injury** you have experienced.

Injury page #2: The **most serious injury** (resulted in the most limited duty days or profile days) you have experienced.

Injury page #3: The **current chronic injury** that you notice most often and can limit your physical activity.

If any of the injuries are the same, please darken the bubble at the top right hand corner of the injury page, so you don't have to fill out the same information more than once.

Technical Report No. S.0023113-14, Aug 2013–May 2014

Injury #1 (Most recent injury)												
Date of Injury Year _____												
Month	<input type="radio"/> Jan	<input type="radio"/> Feb	<input type="radio"/> Mar	<input type="radio"/> Apr	<input type="radio"/> May	<input type="radio"/> Jun	<input type="radio"/> Jul	<input type="radio"/> Aug	<input type="radio"/> Sep	<input type="radio"/> Oct	<input type="radio"/> Nov	<input type="radio"/> Dec
Body Area #1 (Mark One)												
① Abdomen	⑧ Elbow		⑪ Hand		⑮ Lower Back		⑳ Upper Arm					
② Ankle	⑦ Eye		⑫ Head		⑰ Neck		㉑ Upper Back					
③ Calf/Shin	⑥ Face		⑬ Hip		⑱ Shoulders		㉓ Wrist					
④ Chest	⑨ Finger		⑭ Knee		⑲ Thigh		㉔ Other (list) _____					
⑤ Ear	⑩ Foot		⑯ Lower Arm		㉒ Toe							
Type of Injury #1 (Mark One)												
① Abrasion			⑤ Cold Injury			⑨ Fracture			⑬ Sprain/ Strain Overuse			
② Blister			⑧ Cut/laceration			⑩ Heat Injury			⑭ Sprain / Strain Traumatic			
③ Bruise			⑦ Dislocation			⑪ Nerve Injury			⑬ Other (list) _____			
④ Bursitis			⑥ Fasciitis									
Activity of Injury #1 (Mark One)												
① Physical Training (Running)			④ Sports/Recreation (list) _____			⑦ Riding or driving in a motorized vehicle			⑩ Rough-housing or Fighting			
② Physical Training (Not Running)			⑥ Stepping/ Climbing			⑧ Repairing or maintaining equipment			⑪ Gunshot, missile or blast			
③ Other exercise (list) _____			⑥ Walking, Hiking, Marching			⑧ Lifting or moving heavy objects			⑬ Other (list) _____			
Cause of Injury #1 (Mark One)												
① Fall, jump, trip, or slip			③ Cut by a sharp tool, object or instrument			⑤ Overexertion, strenuous or repetitive movements			⑦ Fire, hot substance or object, or steam			
② Struck against or by an object or person			④ Environmental factors such as heat or cold			⑥ Direct or Indirect contact with enemy			⑧ Other (list) _____			
<input type="radio"/> This is a new injury that occurred for the first time <input type="radio"/> This is a re-injury of a previous injury				Total Days of Limited Duty or Profile for this injury <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 33%; height: 20px;"></td> <td style="width: 33%; height: 20px;"></td> <td style="width: 33%; height: 20px;"></td> </tr> </table> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">①</div> <div style="text-align: center;">②</div> <div style="text-align: center;">③</div> </div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">④</div> <div style="text-align: center;">⑤</div> <div style="text-align: center;">⑥</div> </div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">⑦</div> <div style="text-align: center;">⑧</div> <div style="text-align: center;">⑨</div> </div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">⑩</div> <div style="text-align: center;">⑪</div> <div style="text-align: center;">⑫</div> </div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">⑬</div> <div style="text-align: center;">⑭</div> <div style="text-align: center;">⑮</div> </div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">⑯</div> <div style="text-align: center;">⑰</div> <div style="text-align: center;">⑱</div> </div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">⑲</div> <div style="text-align: center;">⑳</div> <div style="text-align: center;">㉑</div> </div>								

Technical Report No. S.0023113-14, Aug 2013–May 2014

Injury #2 (Most Serious Injury) Fill in this bubble if this injury is the same as your most recent injury <input type="radio"/>											
Date of Injury Year _____											
Month	<input type="radio"/> Jan	<input type="radio"/> Feb	<input type="radio"/> Mar	<input type="radio"/> Apr	<input type="radio"/> May	<input type="radio"/> Jun	<input type="radio"/> Jul	<input type="radio"/> Aug	<input type="radio"/> Sep	<input type="radio"/> Oct	<input type="radio"/> Nov Dec
Body Area #2 (Mark One)											
① Abdomen	⑧ Elbow	⑪ Hand	⑫ Lower Back	⑮ Upper Arm							
② Ankle	⑦ Eye	⑩ Head	⑬ Neck	⑯ Upper Back							
③ Calf/Shin	⑥ Face	⑨ Hip	⑭ Shoulders	⑰ Wrist							
④ Chest	⑤ Finger	⑬ Knee	⑱ Thigh	⑲ Other (list) _____							
⑤ Ear	⑩ Foot	⑮ Lower Arm	⑳ Toe								
Type of Injury #2 (Mark One)											
① Abrasion	⑥ Cold Injury	⑨ Fracture	⑫ Sprain/ Strain Overuse								
② Blister	⑧ Cut/laceration	⑩ Heat Injury	⑬ Sprain / Strain Traumatic								
③ Bruise	⑦ Dislocation	⑪ Nerve Injury	⑭ Other (list) _____								
④ Bursitis	⑥ Fasciitis										
Activity of Injury #2 (Mark One)											
① Physical Training (Running)	④ Sports/Recreation (list) _____	⑦ Riding or driving in a motorized vehicle	⑩ Rough-housing or Fighting								
② Physical Training (Not Running)	⑤ Stepping/ Climbing	⑧ Repairing or maintaining equipment	⑪ Gunshot, missile or blast								
③ Other exercise (list) _____	⑥ Walking, Hiking, Marching	⑨ Lifting or moving heavy objects	⑫ Other (list) _____								
Cause of Injury #2 (Mark One)											
① Fall, jump, trip, or slip	③ Cut by a sharp tool, object or instrument	⑥ Overexertion, strenuous or repetitive movements	⑦ Fire, hot substance or object, or steam								
② Struck against or by an object or person	④ Environmental factors such as heat or cold	⑧ Direct or Indirect contact with enemy	⑨ Other (list) _____								

<input type="radio"/> This is a new injury that occurred for the first time <input type="radio"/> This is a re-injury of a previous injury	Total Days of Limited Duty or Profile for this injury <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 33%; height: 20px;"></td> <td style="width: 33%; height: 20px;"></td> <td style="width: 33%; height: 20px;"></td> </tr> </table> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ </div> <div style="width: 30%;"> ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ </div> <div style="width: 30%;"> ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ </div> </div>				Injury Severity Scale: ① No impact on military duties as assigned ② Little impact on military duties as assigned ③ Some impact on military duties as assigned ④ Major impact on military duties as assigned ⑤ Unable to perform military duties as assigned

Have you been seen by a medical professional for this injury?

① Yes
② No

If Yes, were you placed on a profile?

① Yes (limited duty profile)
② Yes (Permanent profile)
③ No

Did this injury occur while:

① On Duty
② Off Duty

Technical Report No. S.0023113-14, Aug 2013–May 2014

Injury #3 (Current Chronic Injury) Fill in the bubble if this injury is the same as your most recent <input type="radio"/> or most serious <input type="radio"/>														
Date of Injury Year _____														
Month <div style="display: flex; justify-content: space-around; align-items: center;"> <div><input type="radio"/> Jan</div> <div><input type="radio"/> Feb</div> <div><input type="radio"/> Mar</div> <div><input type="radio"/> Apr</div> <div><input type="radio"/> May</div> <div><input type="radio"/> Jun</div> <div><input type="radio"/> Jul</div> <div><input type="radio"/> Aug</div> <div><input type="radio"/> Sep</div> <div><input type="radio"/> Oct</div> <div><input type="radio"/> Nov</div> <div><input type="radio"/> Dec</div> </div>														
Body Area #3 (Mark One)														
① Abdomen	⑥ Elbow	⑪ Hand	⑮ Lower Back	⑳ Upper Arm										
② Ankle	⑦ Eye	⑫ Head	⑰ Neck	㉑ Upper Back										
③ Calf/Shin	⑧ Face	⑬ Hip	⑱ Shoulders	㉒ Wrist										
④ Chest	⑨ Finger	⑭ Knee	⑲ Thigh	㉓ Other (list)										
⑤ Ear	⑩ Foot	⑯ Lower Arm	㉔ Toe											
Type of Injury #3 (Mark One)														
① Abrasion	⑤ Cold Injury	⑨ Fracture	⑬ Sprain/ Strain Overuse											
② Blister	⑥ Cut/laceration	⑩ Heat Injury	⑭ Sprain / Strain Traumatic											
③ Bruise	⑦ Dislocation	⑪ Nerve Injury	⑮ Other (list) _____											
④ Bursitis	⑧ Fasciitis													
Activity of Injury #3 (Mark One)														
① Physical Training (Running)	④ Sports/Recreation (list) _____	⑦ Riding or driving in a motorized vehicle	⑩ Rough-housing or Fighting											
② Physical Training (Not Running)	⑤ Stepping/ Climbing	⑧ Repairing or maintaining equipment	⑪ Gunshot, missile or blast											
③ Other exercise (list) _____	⑥ Walking, Hiking, Marching	⑨ Lifting or moving heavy objects	⑬ Other (list) _____											
Cause of Injury #3 (Mark One)														
① Fall, jump, trip, or slip	⑤ Cut by a sharp tool, object or instrument	⑥ Overexertion, strenuous or repetitive movements	⑦ Fire, hot substance or object, or steam											
② Struck against or by an object or person	④ Environmental factors such as heat or cold	⑧ Direct or Indirect contact with enemy	⑨ Other (list) _____											
<input type="radio"/> This is a new injury that occurred for the first time <input type="radio"/> This is a re-injury of a previous injury				Total Days of Limited Duty or Profile for this injury <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; border: 1px solid black; height: 20px;"></td> <td style="width: 33%; border: 1px solid black; height: 20px;"></td> <td style="width: 33%; border: 1px solid black; height: 20px;"></td> </tr> </table>							Injury Severity Scale: <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> ① No impact on military duties as assigned ② Little impact on military duties as assigned ③ Some impact on military duties as assigned ④ Major impact on military duties as assigned ⑤ Unable to perform military duties as assigned </div> <div style="width: 45%;"> Did this injury occur while: ① On Duty ② Off Duty </div> </div>			
Have you been seen by a medical professional for this injury? ① Yes ② No				① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱ ⑲ ⑳ ㉑ ㉒ ㉓ ㉔				8						
If Yes, were you placed on a profile? ① Yes (limited duty profile) ② Yes (Permanent profile) ③ No														

Injury Continued

6. Have you been seen by the SMC Physical Therapist MAJ McLean?

- ☐ ₁ Yes (Skip to Question 9)
☐ ₀ No

7. Do you plan on being seen by the SMC Physical Therapist MAJ McLean?

- ☐ ₁ Yes
☐ ₀ No (Skip to Question 9)

8. If MAJ McLean was not co-located at the Academy with you, would you still go see her?

- ☐ ₁ Yes
☐ ₀ No

Personal Physical Fitness Training

The following questions will ask about your personal physical fitness training. Personal physical training (PT) is any physical fitness training *not* conducted with your unit. Please answer these questions with regard to your *current* personal PT program.

9. Do you perform PT on your own time?

- ☐ ₁ Yes (Continue to next question)
☐ ₀ No (Skip to question #18)

10. On average, how many times per week do you perform distance running for personal PT (i.e., running continuously for 1 mile or more)?

- | | |
|---|---|
| <input type="radio"/> ₀ I don't perform distance running on my own | <input type="radio"/> ₅ 5 times per week |
| <input type="radio"/> ₁ 1 time per week | <input type="radio"/> ₆ 6 times per week |
| <input type="radio"/> ₂ 2 times per week | <input type="radio"/> ₇ 7 times per week |
| <input type="radio"/> ₃ 3 times per week | <input type="radio"/> ₈ > 7 times per week |
| <input type="radio"/> ₄ 4 times per week | |

11. On average, how far do you run when you perform distance runs for personal PT?

- | | |
|--|--|
| <input type="radio"/> ₀ I don't perform distance runs on my own | <input type="radio"/> ₇ 7 miles |
| <input type="radio"/> ₁ 1 mile | <input type="radio"/> ₈ 8 miles |
| <input type="radio"/> ₂ 2 miles | <input type="radio"/> ₉ 9 miles |
| <input type="radio"/> ₃ 3 miles | <input type="radio"/> ₁₀ 10 miles |
| <input type="radio"/> ₄ 4 miles | <input type="radio"/> ₁₁ > 10 miles |
| <input type="radio"/> ₅ 5 miles | |
| <input type="radio"/> ₆ 6 miles | |

12. How many days a week do you perform aerobic endurance that did NOT involve running (ex. elliptical machine, rowing machine, cycling, stair stepper)

- ☐ ₀ I don't perform this type of aerobic endurance training on my own
- ☐ ₁ 1-2 times per week
- ☐ ₂ 3-4 times per week
- ☐ ₃ 5-6 times per week
- ☐ ₄ More than 6 times per week

13. On average, on the days when you perform aerobic endurance that did NOT involve running, how long did you exercise each day?

- ☐ ₀ I don't perform this type of aerobic endurance on my own
- ☐ ₁ 15 minutes or less
- ☐ ₂ 16-30 minutes
- ☐ ₃ 31-45 minutes
- ☐ ₄ 46-60 minutes
- ☐ ₅ 61-90 minutes
- ☐ ₆ > 90 minutes

14. On average, how many times per week do you perform resistance training for personal PT? (i.e., weight lifting using free weights, dumbbells, kettlebells, hammer-strength machines, etc)?

- ☐ ₀ I don't perform resistance training on my own
- ☐ ₁ 1 time per week
- ☐ ₂ 2 times per week
- ☐ ₃ 3 times per week
- ☐ ₄ 4 times per week
- ☐ ₅ 5 times per week
- ☐ ₆ > 5 times per week

15. On average, on the days when you performed resistance training for personal PT, how long did you perform resistance training each day?

- ☐ ₀ I don't perform resistance training on my own
- ☐ ₁ 15 minutes or less
- ☐ ₂ 16-30 minutes
- ☐ ₃ 31-45 minutes
- ☐ ₄ 46-60 minutes
- ☐ ₅ 61-90 minutes
- ☐ ₆ > 90 minutes

16. On average, how many times per week do you perform sprint or interval-style running for personal PT?

Sprints are defined as short bursts of speed that cannot be sustained for more than a few minutes. *Intervals* are short periods of high speed running mixed with periods of jogging or walking.

- ☐ ₀ I don't perform sprint or interval style running on my own
☐ ₁ 1-2 times per week
☐ ₂ 3-4 times per week
☐ ₃ More than 4 times per week

17. What program is your personal physical training program based upon? (select all that apply):

- ☐ ₀ I don't have a personal physical training program
☐ ₁ I don't have a specific personal physical training program
☐ ₂ Traditional Army PT
☐ ₃ Cross-training types of exercises
☐ ₄ Total Body Resistance Exercise (TRX)
☐ ₅ Power 90 Extreme (P90X)
☐ ₆ Crossfit
☐ ₇ Mission Essential Fitness (MEF)
☐ ₈ Insanity
☐ ₉ Other (please name) _____

18. What was the date of your last Army Physical Fitness Test (APFT) (to the best of your recollection)?

Year ☐ 2013 ☐ I did not take an APFT upon arrival at the SGM course

Month ☐ Jul ☐ Aug

18a. What were the raw scores on your most recent Army Physical Fitness Test (APFT)?

a. Push-Ups repetitions

b. Sit-Ups repetitions

c. Run min sec or Walk min sec

or Bike min sec

18b. Were you injured during the Army Physical Fitness Test? ☐ ₁ Yes ☐ ₀ No

18c. If Yes, which event? ☐ ₁ Push-Ups ☐ ₂ Sit-Ups ☐ ₃ Run ☐ ₄ Walk or Bike

18d. Are you on a permanent profile that restricts you from participating in any of the APFT events?

☐ ₁ Yes ☐ ₀ No

If Yes, which event?

☐ ₁ Push-Ups ☐ ₂ Sit-Ups ☐ ₃ Run

Tobacco Use

Please answer these questions with regard to your past and current tobacco use.

19. Have you ever smoked a cigarette?

☐ ₁ Yes (continue to next question)
☐ ₀ No (Skip to question #26)

20. Have you smoked more than 100 cigarettes in your life? (100 cigarettes = 5 packs)

☐ ₁ Yes
☐ ₀ No

21. About how old were you when you smoked a whole cigarette for the first time?

Age when first cigarette smoked

22. During the past 30 days, on how many days did you smoke cigarettes?

☐ ₀ I have not smoked in the last 30 days
☐ ₁ I have smoked in the last 30 days Number of days smoked

23. During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day on average?

☐ ₀ I have not smoked in the last 30 days
☐ ₁ I have smoked in the last 30 days Number of cigarettes smoked per day

24. If you used to smoke cigarettes and quit, how many months or years ago did you quit?

☐ ₀ I have smoked less than 100 cigarettes or I am currently smoking
☐ ₁ I have quit smoking

Months OR Years quit

25. If you are currently smoking, how many years have you been smoking?

- ☐ ₀ I am currently not smoking
☐ ₁ I am currently smoking

____ Number of years smoked

26. Have you ever used smokeless tobacco?

- ☐ ₁ Yes (continue to next question)
☐ ₀ No (Skip to question #31)

27. During the past 30 days, on how many days did you use smokeless tobacco (chewing tobacco, snuff, dip, etc)?

- ☐ ₀ I have not used smokeless tobacco in the last 30 days
☐ ₁ I have used smokeless tobacco in the last 30 days

____ Number of days used smokeless

28. During the past 30 days, on the days you used smokeless tobacco, how many cans, pouches or plugs did you use per day, on average?

- ☐ ₀ I have not used smokeless tobacco in the last 30 days
☐ ₁ I have used smokeless tobacco in the last 30 days

____ Number of cans or ____ Number of pouches or ____ Number of plugs

29. If you used to use smokeless tobacco and quit, how many months or years ago did you quit?

- ☐ ₀ I have used smokeless tobacco less than 100 times or I am currently using smokeless tobacco
☐ ₁ I have quit using smokeless tobacco

____ Months OR ____ Years quit

30. If you are currently using smokeless tobacco, how many years have you been using smokeless tobacco?

- ☐ ₀ I am not currently using smokeless tobacco
☐ ₁ I am currently using smokeless tobacco

____ Number of years used smokeless

Nutrition

The next questions are about your nutrition and dietary habits. Some of these questions are about meals consumed. Meals are defined as breakfast, lunch, and dinner.

31. In general, how healthy is your overall diet? Would you say.....

- ☐ ₁ Excellent
- ☐ ₂ Very Good
- ☐ ₃ Good
- ☐ ₄ Fair
- ☐ ₅ Poor

32. How many times per week do you eat breakfast?

- ☐ ₁ Never
- ☐ ₂ 1-2 times per week
- ☐ ₃ 3-4 times per week
- ☐ ₄ 5-7 times per week

33. What is your largest meal during the day?

- ☐ ₁ Breakfast
- ☐ ₂ Lunch
- ☐ ₃ Dinner
- ☐ ₄ All of my meals were typically the same size

34. During a typical week, how many meals do you get from fast food restaurants?

- ☐ ₀ None
- ☐ ₁ 1-3 meals
- ☐ ₂ 4-6 meals
- ☐ ₃ 7-10 meals
- ☐ ₄ more than 10 meals

35. On an average day, how many cups of coffee do you drink a day (one cup is approximately 8 ounces)?

- ☐ ₀ None
- ☐ ₁ 1 cup
- ☐ ₂ 2 cups
- ☐ ₃ 3 cups
- ☐ ₄ 4 cups
- ☐ ₅ > 4 cups

36. On an average day, how many ounces of soda do you drink (one can is approximately 12 ounces)?

- ☐ ₀ None
- ☐ ₁ 12 ounces or one can
- ☐ ₂ 24 ounces or two cans
- ☐ ₃ 36 ounces or three cans
- ☐ ₄ more than 36 ounces or three cans

37. On an average day, how many ounces of water do you drink?

- ☐ ₀ None
- ☐ ₁ 16 ounces or 2 cups
- ☐ ₂ 32 ounces or 4 cups
- ☐ ₃ 64 ounces or 8 cups
- ☐ ₄ 128 ounces or 16 cups
- ☐ ₅ more than 1 gallon

38. On an average day, how many energy drinks do you drink (the size of an 8.3 ounce RedBull® can)?
For larger sized cans, estimate how many cans of RedBull® the can would hold (i.e. larger cans may be as many as 3 RedBulls®)

- ☐ ₀ None
- ☐ ₁ 1-2 cans
- ☐ ₂ 3-4 cans
- ☐ ₃ 5-6 cans
- ☐ ₄ more than 6 cans

39. On an average day, how many ounces of sports drinks (Gatorade®, Powerade®, etc.) do you drink (one bottle is approximately 20 ounces)?

- ☐ ₀ None
- ☐ ₁ 20 ounces or one bottle
- ☐ ₂ 40 ounces or two bottles
- ☐ ₃ 60 ounces or three bottles
- ☐ ₄ more than 60 ounces or three bottles

40. On an average day, how many cups of dark green vegetables (spinach, romaine lettuce, broccoli) do you eat?

- ☐ ₀ None
- ☐ ₁ 1 or less cup raw or (1/2 cup cooked)
- ☐ ₂ 2 cups raw or (1 cup cooked)
- ☐ ₃ 3 cups raw or (1 ½ cups cooked)
- ☐ ₄ 4 or more cups or (2 or more cups cooked)

41. Do you make an effort to always eat/drink a meal (or protein/energy bar or protein shake) within 30 minutes after PT or working out?

- ☐ 1 Always
- ☐ 2 Sometimes
- ☐ 3 Never

42. How would you define your weight goals?

- ☐ 0 Don't have weight goals
- ☐ 1 Gain weight
- ☐ 2 Maintain weight
- ☐ 3 Lose weight

43. Do you take dietary supplements?

(select all that apply):

Dietary supplements are taken by mouth, contain a dietary ingredient and come in many forms such as tablets, liquids, energy bars, powders and capsules

- ☐ 0 Do not take dietary supplements
- ☐ 1 Just started taking dietary supplements
- ☐ 2 Vitamins/Multivitamin (please specify) _____
- ☐ 3 Weight loss supplements (please specify) _____
- ☐ 4 Performance/muscle enhancement supplements (please specify) _____
- ☐ 5 Nutrition enhancement supplements (please specify) _____
- ☐ 6 Healthy joint supplements (please specify) _____
- ☐ 7 Other (please specify) _____

44. What reasons do you take dietary supplements?

(select all that apply):

- ☐ 0 Do not take dietary supplements
- ☐ 1 Promote general health
- ☐ 2 Give more energy
- ☐ 3 Greater muscle strength
- ☐ 4 Performance enhancer
- ☐ 5 Healthy joints
- ☐ 6 Weight loss
- ☐ 7 Increased endurance
- ☐ 8 Not sure
- ☐ 9 Other _____ (please specify)

Appendix C

Sergeants Major Course (SMC) Class 64 Follow-up Survey

(Note: Survey was administered electronically; length does not represent actual page length of survey and question numbers represent internal numbering system of Verint® software. Skip patterns are indicated.)

SMA Course Follow-up

PRIVACY ACT STATEMENT – HEALTH CARE RECORDS, FITNESS TEST SCORES, AND QUESTIONNAIRE

1. AUTHORITY FOR COLLECTION OF INFORMATION

Public Law 104-191, Section 1178; Executive Order 9397; Section 8103, Title 5, United States Code

2. PRINCIPLE PURPOSES FOR WHICH INFORMATION IS INTENDED TO BE USED

This form provides you the advice required by the Privacy Act of 1974. The information obtained from this project will be used to reduce injuries and improve the health and fitness of Soldiers. We will need to obtain your name and 3-digit student identification number in order to link your questionnaire information with other data such as Army Physical Fitness Test (APFT) scores and information on injuries you may have had in the last year. The questionnaire obtains information on current physical fitness activities, tobacco use, dietary habits, and previous and/or current injuries.

3. ROUTINE USES

The primary use of this information is to improve the health of those attending the Sergeants Major Academy (SMA). The data obtained from the questionnaires will be included in a database that contains the same information for all Soldiers participating in this project. The only personnel having access to this information will be the public health officials who will analyze the information. You will not be personally identified in any report or any output of any type since the interest is in the health and fitness of the Unit and not the health and fitness of any single individual.

The database that is established will identify current level of fitness and factors that lower Soldiers' risk of injury and enhance fitness. The database will be used to make recommendations to decision makers regarding programs and policies that might improve fitness and reduce the incidence of injury.

4. WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION

Disclosure of the requested information is voluntary. If you do not disclose the information, you will not be included in the database and you will not participate in this project designed to reduce injuries and improve the health and fitness of Soldiers at the Sergeants Major Academy.

Subject Demographics

1. Today's Date

Date (mm/dd/yyyy) _____

2. What is your 3 digit student number?

Student number _____

3. Background Details

First Name _____

Last Name _____

Height (feet) ____

Height (inches) ____

Weight (lbs) ____

Date of Birth (mm/dd/yyyy) _____

4. What is your gender?

☐ Male

☐ Female

5. What service are you in?

☐ Army

☐ Air Force

☐ Coast Guard

☐International

☐Marines

☐Navy

☐Other _____

6. What is your component?

☐Active duty

☐Reserve

☐National Guard

☐Other _____

**7. What is your military occupational specialty (MOS), AOC or Functional Area?
(e.g., 11B)**

Please Specify _____

(End of Page 2)

162. Are you currently on permanent profile?

☐ Yes, I am on permanent profile

☐ No, I am not on permanent profile

Destination: **Page 5** (Set in 162 (No, I am not on permanent profile))

(End of Page 3)

164. How long have you been on permanent profile? (If not applicable, fill in the a "0").

Years _____

Months _____

Days _____

165. Does your permanent profile limit your physical training or job duties?

☐ No

☐ Little impact

☐ Some impact

☐ Significant impact

☐ Unable to perform military duties as assigned

(End of Page 4)

The next questions capture additional information on any NEW injury or injuries you have experienced during the SMA Course that currently limit your physical activity or job duties.

As a reminder, injuries can occur in two ways:

- 1) When strong sudden forces are applied to the body – these would include events like falling from a ladder, an automobile crash, or being hit by a bullet fired from a weapon.
- 2) When smaller forces are applied to the body repeatedly – these would include activities like running long distances, repetitive lifting/pulling/pushing objects, or repeatedly pitching a softball.

Please provide information on a NEW injury you experienced that limited your physical activity or job duties during the SMA Course.

19. Did you experience a NEW injury during the SMA Course that limited your physical activity or job duties?

☐ Yes

☐ No

Destination: **Page 41** (Set in 19 (No))

(End of Page 23)

The next questions capture additional information on the **NEW** injury you have experienced during the SMA Course that currently limits your physical activity or job duties.

As a reminder, injuries can occur in two ways:

- 1) When strong sudden forces are applied to the body – these would include events like falling from a ladder, an automobile crash, or being hit by a bullet fired from a weapon. Such forces result in **acute or traumatic injuries**.
- 2) When smaller forces are applied to the body repeatedly – these would include activities like running long distances, repetitive lifting/pulling/pushing objects, or repeatedly pitching a softball. Such forces result in overuse or chronic injuries.

173.

Estimate the approximate date of your injury.

- ☐ August 2013
- ☐ September 2013
- ☐ October 2013
- ☐ November 2013
- ☐ December 2013
- ☐ January 2014
- ☐ February 2014
- ☐ March 2014
- ☐ April 2014
- ☐ May 2014

21. Primary body area injured?

- ☐ Head

- ☐ Neck
- ☐ Shoulders
- ☐ Arm (upper)
- ☐ Arm (lower)
- ☐ Elbow
- ☐ Wrist
- ☐ Hand
- ☐ Chest/ribs
- ☐ Abdomen
- ☐ Back (lower)
- ☐ Back (upper)
- ☐ Spine
- ☐ Hip
- ☐ Thigh/Hamstring
- ☐ Knee
- ☐ Ankle
- ☐ Foot
- ☐ Other (**Please Specify**) _____

22. Type of injury?

- ☐ Abrasion
- ☐ Blister
- ☐ Bruise

- ☐ Bursitis
- ☐ Cut/laceration
- ☐ Dislocation
- ☐ Fascitis
- ☐ Fracture/Break
- ☐ Heat injury
- ☐ Nerve injury
- ☐ Sprain/strain overuse
- ☐ Sprain/strain traumatic
- ☐ Tear
- ☐ Blunt force trauma
- ☐ Spinal injury (i.e. bulging or slipped disk)
- ☐ Other **(Please Specify)** _____

23. Please select the specific activity associated with the injury?

- ☐ Gunshot, missile, or blast
- ☐ Lifting or moving heavy objects
- ☐ Physical training
- ☐ Repairing or maintaining equipment
- ☐ Riding or driving in a motorized vehicle
- ☐ Rough-housing or fighting
- ☐ Sports/recreation
- ☐ Stepping/climbing

☐ Walking, Hiking or Marching

☐ Other (**Please Specify**) _____

Destination: **Page 27** (Set in 23 (Gunshot, missile, or blast))

Destination: **Page 27** (Set in 23 (Lifting or moving heavy objects))

Destination: **Page 26** (Set in 23 (Physical training))

Destination: **Page 27** (Set in 23 (Repairing or maintaining equipment))

Destination: **Page 27** (Set in 23 (Riding or driving in a motorized vehicle))

Destination: **Page 27** (Set in 23 (Rough-housing or fighting))

Destination: **Page 27** (Set in 23 (Stepping/climbing))

Destination: **Page 27** (Set in 23 (Walking, Hiking or Marching))

Destination: **Page 27** (Set in 23 (Other (**Please Specify**)))

(End of Page 24)

102. Please select the sport associated with the injury:

☐ Football

☐ Basketball

☐ Soccer

☐ Volleyball

☐ Softball

☐ Other **(Please Specify)** _____

Destination: **Page 27** (Set in 102)

(End of Page 25)

103. Please specify the physical training that caused the injury:

☐ Running

☐ Weight-lifting

☐ Extreme conditioning

☐ Other (**Please Specify**) _____

(End of Page 26)

24. Please select the specific cause associated with the injury:

- ☐ Cut by a sharp tool, object or instrument
- ☐ Environmental factors such as heat, cold, insect bites
- ☐ Fall, jump, slip, or trip
- ☐ Fire, hot substance or object, or steam
- ☐ Overexertion, strenuous or repetitive movements (**Please specify**)

- ☐ Struck by or against an object or person
- ☐ Other (**Please Specify**) _____

Destination: **Page 29** (Set in 24 (Cut by a sharp tool, object or instrument))

Destination: **Page 29** (Set in 24 (Environmental factors such as heat, cold, insect bites))

Destination: **Page 29** (Set in 24 (Fire, hot substance or object, or steam))

Destination: **Page 29** (Set in 24 (Overexertion, strenuous or repetitive movements (**Please specify**)))

Destination: **Page 29** (Set in 24 (Struck by or against an object or person))

Destination: **Page 29** (Set in 24 (Other (**Please Specify**)))

(End of Page 27)

159. If injury was from a Fall, please specify. Fall was from...

☐ Motor Vehicle

☐ Aircraft

☐ Raised surface or platform **6ft or higher** (not from a motor vehicle or aircraft)

☐ Raised surface or platform **less than 6 ft high** (not from a motor vehicle or aircraft)

☐ Floor/ground (e.g., slipped)

☐ Other **(Please Specify)** _____

(End of Page 28)

28. Have you been seen by a medical professional for this injury?

☐ Yes

☐ No

Destination: **Page 31** (Set in 28 (No))

(End of Page 29)

25. Were you placed on temporary profile for this injury during the SMA course?

☐ Yes

☐ No

26. If you were placed on temporary profile for this injury, how many days? **(If not applicable, please enter '0')**

Number of Days _____

(End of Page 30)

29. What impact does this injury currently have on your physical activity or job duties?

- ☐ No impact on current physical training
- ☐ Little impact
- ☐ Some impact
- ☐ Significant impact
- ☐ Unable to perform military duties as assigned

30. Did this injury occur while:

- ☐ On Duty
- ☐ Off-Duty

(End of Page 31)

126. Do you have another NEW injury that limited your physical ability during SMA?

☐ Yes

☐ No

Destination: **Page 41** (Set in 126 (No))

(End of Page 32)

174.

Estimate the approximate date of your injury.

- ☐ August 2013
- ☐ September 2013
- ☐ October 2013
- ☐ November 2013
- ☐ December 2013
- ☐ January 2014
- ☐ February 2014
- ☐ March 2014
- ☐ April 2014
- ☐ May 2014

127. Primary body area injured?

- ☐ Head
- ☐ Neck
- ☐ Shoulders
- ☐ Arm (upper)
- ☐ Arm (lower)
- ☐ Elbow
- ☐ Wrist
- ☐ Hand
- ☐ Chest/ribs
- ☐ Abdomen

☐ Back (lower)

☐ Back (upper)

☐ Spine

☐ Hip

☐ Thigh/Hamstring

☐ Knee

☐ Ankle

☐ Foot

☐ Other (**Please Specify**) _____

128. Type of injury?

☐ Abrasion

☐ Blister

☐ Bruise

☐ Bursitis

☐ Cut/laceration

☐ Dislocation

☐ Fascitis

☐ Fracture/Break

☐ Heat injury

☐ Nerve injury

☐ Sprain/strain overuse

☐ Sprain/strain traumatic

- ☐Tear
- ☐Blunt force trauma
- ☐Spinal injury (i.e. bulging or slipped disk)
- ☐Other (**Please Specify**) _____

129. Please select the specific activity associated with the injury?

- ☐Gunshot, missile, or blast
- ☐Lifting or moving heavy objects
- ☐Physical training
- ☐Repairing or maintaining equipment
- ☐Riding or driving in a motorized vehicle
- ☐Rough-housing or fighting
- ☐Sports/recreation
- ☐Stepping/climbing
- ☐Walking, Hiking or Marching
- ☐Other (**Please Specify**) _____

Destination: **Page 36** (Set in 129 (Gunshot, missile, or blast))
Destination: **Page 36** (Set in 129 (Lifting or moving heavy objects))
Destination: **Page 35** (Set in 129 (Physical training))
Destination: **Page 36** (Set in 129 (Repairing or maintaining equipment))
Destination: **Page 36** (Set in 129 (Riding or driving in a motorized vehicle))
Destination: **Page 36** (Set in 129 (Rough-housing or fighting))
Destination: **Page 36** (Set in 129 (Stepping/climbing))
Destination: **Page 36** (Set in 129 (Walking, Hiking or Marching))
Destination: **Page 36** (Set in 129 (Other (**Please Specify**)))

(End of Page 33)

130. Please select the sport associated with the injury:

☐ Football

☐ Basketball

☐ Soccer

☐ Volleyball

☐ Softball

☐ Other (**Please Specify**) _____

Destination: **Page 36** (Set in 130)

(End of Page 34)

132. Please specify the physical training that caused the injury:

☐ Running

☐ Weight-lifting

☐ Extreme conditioning

☐ Other (**Please Specify**) _____

(End of Page 35)

133. Please select the specific activity associated with the injury:

- ☐ Cut by a sharp tool, object or instrument
- ☐ Environmental factors such as heat, cold, insect bites
- ☐ Fall, jump, slip, or trip
- ☐ Fire, hot substance or object, or steam
- ☐ Overexertion, strenuous or repetitive movements **(Please Specify)**

- ☐ Struck by or against an object or person
- ☐ Other **(Please Specify)** _____

Destination: **Page 38** (Set in 133 (Cut by a sharp tool, object or instrument))

Destination: **Page 38** (Set in 133 (Environmental factors such as heat, cold, insect bites))

Destination: **Page 38** (Set in 133 (Fire, hot substance or object, or steam))

Destination: **Page 38** (Set in 133 (Overexertion, strenuous or repetitive movements **(Please Specify)**))

Destination: **Page 38** (Set in 133 (Struck by or against an object or person))

Destination: **Page 38** (Set in 133 (Other **(Please Specify)**))

(End of Page 36)

168. If injury was from a Fall, please specify. Fall was from...

☐ Motor vehicle

☐ Aircraft

☐ Raised surface or platform **6ft or higher** (not from a motor vehicle or aircraft)

☐ Raised surface or platform **less than 6 ft high** (not from a vehicle or airplane)

☐ Floor/ground (e.g., slipped)

☐ Other (**Please Specify**) _____

(End of Page 37)

136. Have you been seen by a medical professional for this injury?

☐ Yes

☐ No

Destination: **Page 40** (Set in 136 (No))

(End of Page 38)

138. Were you placed on temporary profile for this injury during the SMA course?

☐ Yes

☐ No

139. If you were placed on temporary profile for this injury, how many days? **(If not applicable, please enter '0')**

Number of Days _____

(End of Page 39)

140. What impact does this injury currently have on your physical activity or job duties?

- ☐ No impact
- ☐ Little impact
- ☐ Some impact
- ☐ Significant impact
- ☐ Unable to perform military duties as assigned

141. Did this injury occur while:

- ☐ On Duty
- ☐ Off-Duty

(End of Page 40)

31. Have you been seen as a patient by the AWC physical therapist MAJ McLean?

- ☐ Yes, for a NEW injury acquired during the SMA course
- ☐ Yes, for an injury sustained PRIOR to the SMA course
- ☐ Yes, for both a new injury and prior injury
- ☐ No

Destination: **Page 43** (Set in 31 (Yes, for a NEW injury acquired during the SMA course))

Destination: **Page 43** (Set in 31 (Yes, for an injury sustained PRIOR to the SMA course))

Destination: **Page 43** (Set in 31 (Yes, for both a new injury and prior injury))

(End of Page 41)

32. If you DID NOT go see MAJ McLean for her services this school year, why not?

☐ Not Injured, so I did not need help

☐ I don't know who MAJ McLean is

☐ Appointment availability conflicted with my schedule

☐ I did not think she could help me with my problem or it would not improve my performance

☐ Other _____

Destination: **Page 44** (Set in 32)

(End of Page 42)

170. If MAJ McLean was not co-located at the Academy with you, would you still go see her?

☐ Yes

☐ No

33. If you saw MAJ McLean as a patient over the school year, would you recommend her services to your classmates, or to students in the next class?

☐ Yes

☐ No

107. If you would not recommend her services to your classmates, Please specify why?

Please Specify

(End of Page 43)

Personal Physical Fitness Training

34. Do you perform PT on your own time?

☐ Yes

☐ No

Destination: **Page 54** (Set in 34 (No))

(End of Page 44)

35. Do you perform **distance running** for personal PT (i.e., running continuously for 1 mile or more)?

☐ Yes

☐ No

Destination: **Page 47** (Set in 35 (No))

(End of Page 45)

36. On average, how many times per week do you perform **distance running** for personal PT (e.g., running continuously for 1 mile or more)?

- ☐ < 1 times per week
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3 times per week
- ☐ 4 times per week
- ☐ 5 times per week
- ☐ 6 times per week
- ☐ 7 times per week
- ☐ >7 times per week

37. On average, how far do you run when you perform **distance runs** for personal PT?

- ☐ 1 mile
- ☐ 2 miles
- ☐ 3 miles
- ☐ 4 miles
- ☐ 5 miles
- ☐ 6 miles
- ☐ 7 miles
- ☐ 8 miles
- ☐ 9 miles
- ☐ 10 miles

○>10 miles

(End of Page 46)

38. Do you perform **aerobic endurance activities that do NOT involve running** (e.g., elliptical machines, rowing machine, cycling, stair stepper)?

☐ Yes

☐ No

Destination: **Page 49** (Set in 38 (No))

(End of Page 47)

39. How many times per week do you perform **aerobic endurance activities that does NOT involve running** (e.g., elliptical machine, rowing machine, cycling, stair stepper)?

- ☐ <1 time per week
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3 times per week
- ☐ 4 times per week
- ☐ 5 times per week
- ☐ 6 times per week
- ☐ 7 times per week
- ☐ >7 times per week

40. On average, on the days when you perform **aerobic endurance activities that does NOT involve running**, how long did you exercise each day?

- ☐ 15 minutes or less
- ☐ 16-30 minutes
- ☐ 31-45 minutes
- ☐ 46-60 minutes
- ☐ 61-90 minutes
- ☐ >90 minutes

(End of Page 48)

41. Do you perform **resistance training** for personal PT (e.g., weight lifting using free weights, dumbbells, kettlebells, hammer-strength machines, etc.)?

☐ Yes

☐ No

Destination: **Page 51** (Set in 41 (No))

(End of Page 49)

42. On average, how many times per week do you perform **resistance training** for personal PT (e.g., weight lifting using free weights, dumbbells, kettlebells, hammer-strength machines, etc.)?

- ☐ < 1 time per week
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3 times per week
- ☐ 4 times per week
- ☐ 5 times per week
- ☐ 6 times per week
- ☐ 7 times per week
- ☐ >7 times per week

43. On average, on the days when you perform **resistance training** for personal PT, how long do you perform resistance training each day?

- ☐ 15 minutes or less
- ☐ 16-30 minutes
- ☐ 31-45 minutes
- ☐ 46-60 minutes
- ☐ 61-90 minutes
- ☐ >90 minutes

(End of Page 50)

44. Do you perform **sprint or interval-style running** for personal PT?

☐ Yes

☐ No

Destination: **Page 53** (Set in 44 (No))

(End of Page 51)

45. On average, how many times per week do you perform **sprint or interval-style running** for personal PT?

- ☐ <1 time per week
- ☐ 1 time per week
- ☐ 2 times per week
- ☐ 3 times per week
- ☐ 4 times per week
- ☐ 5 times per week
- ☐ 6 times per week
- ☐ 7 times per week
- ☐ >7 times per week

108. On average, on the days when you perform **sprint or interval-style running** for personal PT, how long do you perform **sprint or interval-style running** training each day?

- ☐ 15 minutes or less
- ☐ 16-30 minutes
- ☐ 31-45 minutes
- ☐ 46-60 minutes
- ☐ 61-90 minutes
- ☐ >90 minutes

(End of Page 52)

47. What program, if any, is your personal physical training program based upon? **(Select all that apply)**

☐ Army Physical Readiness Training Manual (FM 7-22)

☐ Cross-training types of exercises

☐ Total body resistance exercise (TRX)

☐ Power 90 Extreme (P90X)

☐ Crossfit

☐ Mission Essential Fitness (MEF)

☐ Insanity

☐ Other **(Please Specify)** _____

☐ No specific program

(End of Page 53)

Physical Fitness Test (PFT)

48. What was the approximate date of your most recent PFT?

Approximate Date (mm/dd/yyyy) _____

49. What were the raw scores on your most recent PFT? **(Enter "0" if not applicable)**

Push-ups (repetitions) _____

Sit-ups (repetition) _____

2-Mile Run time (min:sec) _____

1.5 Mile Run time (min:sec) (Air Force Only) _____

Walk time (min:sec) _____

Bike time (min:sec) _____

Other **(Please Specify)** _____

(End of Page 54)

50. Were you injured during Physical Fitness testing (PFT)?

☐ Yes

☐ No

Destination: **Page 57** (Set in 50 (No))

(End of Page 55)

51. If "yes", which event?

☐ Push-ups

☐ Sit-ups

☐ Run

☐ Walk or Bike

(End of Page 56)

52. Are you on permanent profile that restricts you from participating in any of the PFT events?

☐ Yes

☐ No

Destination: **Page 59** (Set in 52 (No))

(End of Page 57)

53. If "Yes", which event(s)?

☐ Push-ups

☐ Sit-ups

☐ Run

(End of Page 58)

Tobacco Use

54. Have you ever smoked a cigarette?

☐ Yes

☐ No

Destination: **Page 64** (Set in 54 (No))

(End of Page 59)

55. About how old were you when you smoked a whole cigarette for the first time?

Age when smoked first cigarette _____

56. Have you smoked more than 100 cigarettes in your life? (100 cigarettes=5 packs)

☐ Yes

☐ No

Destination: **Page 64** (Set in 56 (No))

(End of Page 60)

57. Have you smoked in the last 30 days?

☐ I have smoked in the last 30 days

☐ I have **NOT** smoked in the last 30 days

☐ I have **QUIT** smoking and have not smoked in the last 30 days

Destination: **Page 63** (Set in 57 (I have smoked in the last 30 days))

Destination: **Page 64** (Set in 57 (I have **NOT** smoked in the last 30 days))

(End of Page 61)

58. If you have quit smoking, how many months or years ago did you quit? **(If not applicable, please enter '0')**

Years quit ____

Months quit ____

Destination: **Page 64** (Set in 58)

(End of Page 62)

59. In the past 30 days, how many days did you smoke?

Number of days ____

60. In the last 30 days, how many cigarettes on average per day?

Cigarettes per day on average ____

61. How long have you been smoking? (If not applicable, please enter '0')

Number of years currently smoking ____

Number of months currently smoking ____

(End of Page 63)

Smokeless Tobacco

62. Have you ever used e-cigarettes?

☐ Yes

☐ No

63. Have you ever used smokeless tobacco (chewing tobacco, snuff, dip, etc.)?

☐ Yes

☐ No

Destination: **Page 68** (Set in 63 (No))

(End of Page 64)

64. Have you used smokeless tobacco (chewing tobacco, snuff, dip, etc.) in the last 30 days?

- ☐ I have used smokeless tobacco in the last 30 days
- ☐ I have **NOT** used smokeless tobacco in the last 30 days
- ☐ I have **QUIT** using smokeless tobacco, and have not used in the last 30 days

Destination: **Page 67** (Set in 64 (I have used smokeless tobacco in the last 30 days))

Destination: **Page 68** (Set in 64 (I have **NOT** used smokeless tobacco in the last 30 days))

(End of Page 65)

65. If you have quit using smokeless tobacco, how long ago did you quit? **(If not applicable, please enter '0')**

Years quit ____

Months quit ____

Destination: **Page 68** (Set in 65)

(End of Page 66)

66. How many days did you use smokeless tobacco in the last 30 days?

Number of days ____

67. How many cans, pouches, or plugs did you use **PER DAY** on average in the last 30 days? **(If not applicable, please enter '0')**

Number of Cans ____

Number of Pouches ____

Number of Plugs ____

68. How long have you been using smokeless tobacco? **(If not applicable, please enter '0')**

Years used ____

Months used ____

(End of Page 67)

Nutrition

69. In general, how healthy is your overall diet? Would you say...

- ☐Excellent
- ☐Very good
- ☐Good
- ☐Fair
- ☐Poor

70. How many times per week do you eat breakfast?

- ☐Never
- ☐1-2 times per week
- ☐3-4 times per week
- ☐5-7 times per week

71. What is your largest meal of the day?

- ☐Breakfast
- ☐Lunch
- ☐Dinner
- ☐All of my meals are typically the same size

72. During a typical week, how many meals do you get from fast food restaurants?

- ☐None
- ☐1-3 meals

☐ 4-6 meals

☐ 7-10 meals

☐ More than 10 meals

73. On an average day, how many cups of coffee do you drink in a day (one cup is approximately 8 ounces)?

☐ None

☐ 8 ounces or 1 cup

☐ 16 ounces or 2 cups

☐ 24 ounces or 3 cups

☐ 32 ounces or 4 cups

☐ More than 32 ounces or 4 cups

74. On an average day, how many ounces of soda (regular and/or diet) do you drink (one can is approximately 12 ounces)?

☐ None

☐ 12 ounces or one can

☐ 24 ounces or 2 cans

☐ 36 ounces or 3 cans

☐ More than 36 ounces or 3 cans

75. On an average day, how many ounces of water do you drink?

☐ None

☐ 16 ounces or 2 cups

- ☐ 32 ounces or 4 cups
- ☐ 64 ounces or 8 cups
- ☐ 128 ounces or 16 cups
- ☐ More than 1 gallon

76. On an average day, how many ounces of energy drinks (e.g. Red Bull, Monster, NOS) do you consume?

- ☐ None
- ☐ 8 ounces or 1 cup
- ☐ 16 ounces or 2 cups
- ☐ 20 ounces or 3 cups
- ☐ 32 ounces or 4 cups
- ☐ More than 32 ounces or 4 cups

77. On an average day, how many ounces of sports drinks (Gatorade, Powerade, etc. But NOT zero calorie sports drink, such as Powerade Zero) do you drink (one bottle is approximately 20 ounces)?

- ☐ None
- ☐ 20 ounces or 1 bottle
- ☐ 40 ounces or 2 bottles
- ☐ 60 ounces or 3 bottles
- ☐ More than 60 ounces or 3 bottles

78. On an average day, how many cups of dark green vegetables (spinach, romaine lettuce, broccoli) do you eat?

☐ None

☐ 1 or less cups raw or (1/2 cup cooked)

☐ 2 cups raw or (1 cup cooked)

☐ 3 cups raw or (1.5 cups cooked)

☐ 4 or more cups or (2 or more cups cooked)

(End of Page 68)

79. On an average day, how many servings of whole fruit do you consume?
(Examples of one serving of whole fruit: Whole fruit is 1/2 banana, 1 1/4 cups strawberries, 3/4 cup pineapple, 1 cup grapes, 1/2 cup mango, 1 small apple the size of a tennis ball, 1 medium peach (3/4 cup), etc. Do not factor in juice consumption or fruit snacks.)

- ☐ None
- ☐ 1 or less
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 or more

80. On an average day, how many servings of whole grains do you consume?
(Examples of one serving of whole grains: Whole grains may be 1/2 cup whole wheat pasta, 1 piece of whole wheat bread, 4-6 whole wheat crackers, 1 cup of whole grain cereal, 1/2 cup brown rice, 1/2 cup oatmeal, etc.)

- ☐ None
- ☐ 1 or less
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 or more

81. On an average day, how many servings of dairy products do you consume?
(Examples of one serving of dairy products: 8 oz milk (may be cow, rice, almond, soy, goat), 6 oz yogurt or 1 oz cheese (about the size of thumb))

- ☐ None
- ☐ 1

☐2

☐3

☐4

☐5 or more

82. On an average day, do you eat 3 meals and 1-2 snacks in between meals?

☐Yes

☐No

83. Do you make an effort to always eat/drink a meal (or protein/energy bar/protein shake) within 30 minutes after PT or working out?

☐Always

☐Sometimes

☐Never

(End of Page 69)

84. Have you gained or lost weight while attending the SMA course?

- ☐ Neither gained nor lost weight
- ☐ I GAINED weight, and I have NOT lost or am still gaining weight
- ☐ I GAINED weight, but I already lost it
- ☐ I LOST weight, and I have NOT gained it back or I am still losing weight
- ☐ I LOST weight, but I already gained it back

86. How would you define your weight goals?

- ☐ I don't have weight goals
- ☐ Gain weight
- ☐ Maintain weight
- ☐ Lose weight

87. Did your diet change due to coming to the SMA without your family?

- ☐ Yes
- ☐ No

88. Which of the following three nutrients should you consume the most of for a healthy diet:

- ☐ Fat
- ☐ Protein
- ☐ Carbohydrate
- ☐ Unsure

89. On an average night, how many hours of sleep do you get?

☐ 4 or less

☐ 5-6

☐ 7

☐ 8 or more

(End of Page 70)

90. Do you take dietary supplements?

☐ Yes

☐ No

Destination: **Page 73** (Set in 90 (No))

(End of Page 71)

91. What dietary supplements do you take? (Select all that apply)

- ☐ Vitamins/multivitamin
- ☐ Weight loss supplements
- ☐ Performance/muscle enhancement supplements
- ☐ Nutrition enhancement supplements
- ☐ Healthy joint supplements
- ☐ Other **(Please Specify)** _____

92. What reasons do you take dietary supplements? (Select all that apply)

- ☐ Promote general health
- ☐ Give more energy
- ☐ Greater muscle strength
- ☐ Performance enhancer
- ☐ Healthy joints
- ☐ Weight loss
- ☐ Increased endurance
- ☐ Not sure
- ☐ Other **(Please Specify)** _____

(End of Page 72)

93. Have you been seen by the SMA Registered Dietitian CPT Sanchez?

☐ Yes

☐ No

Destination: **Page 75** (Set in 93 (No))

(End of Page 73)

96. If CPT Sanchez was not co-located at the Academy with you, would you still go see her?

☐ Yes

☐ No

Destination: **Survey Submitted** (Set in 96)

(End of Page 74)

94. Do you plan on being seen by the SMA Registered Dietitian CPT Sanchez?

☐ Yes

☐ No

Destination: **Survey Submitted** (Set in 94 (Yes))

(End of Page 75)

95. If you do not plan on seeing her, what is the main reason?

☐ Don't know what she can do for me

☐ My diet is great, and I don't want help

☐ Appointment times are not ideal

☐ Other **(Please specify)** _____

(End of Page 76)

This is the end of the survey. Please Click "Submit" survey button below.

If you need to review your responses or make changes to the survey, please use the Back button at the bottom of your screen.

(End of Page 77)

Appendix D

Comparison of Survey Respondents (Evaluation Sample) and Non-Respondents, Sergeants Major Course (SMC) Class 64

Table D-1. Comparison of Demographics and Injury Data from Electronic Medical Records: Evaluation Sample (Respondents) vs. Non-Respondents

Variable	Categories	Evaluation sample with medical record (n=385) ^a n (%)	Non- respondents with medical record (n=100) ^a n (%)	Chi-square p-value (sample vs. all)
Gender	Male Female	342 (89) 43 (11)	88 (88) 12 (12)	0.82
Age	≤40 41-43 ≥44	140 (36) 126 (33) 119 (31)	28 (28) 29 (29) 43 (43)	0.06
Race	White Black Other	198 (51) 130 (34) 57 (15)	38 (38) 45(45) 17 (17)	0.18
Marital status	Single Married Other	11 (3) 328 (85) 46 (12)	5 (5) 88 (88) 7(7)	0.23
Education level	No High School High school or equiv. < 4 years college Bachelor's Master's or above Unknown	1 (<1) 85 (22) 154 (40) 118 (31) 25 (6) 2 (1)	0 (0) 24 (24) 46 (46) 24 (24) 5 (5) 1 (1)	0.63
Service	Air Force Army Coast Guard Marines International	1 (<1) 379 (98) 1 (<1) 4 (1) 0	1 (1) 95 (95) 2 (2) 2 (2) 0	0.13
Component	Active Duty National Guard Reserve	344 (89) 7(2) 34(9)	84 (84) 3 (3) 13 (13)	0.33
Treatment for injury during SMC	Yes No	258 (67) 127 (33)	79 (79) 21 (21)	0.02

Note:

^aElectronic medical records were not available for international students in the evaluation sample (n=21) and among all initially enrolled (n=18).

Table D-2. Comparison of APFT Performance from Unit Records: Evaluation Sample (Survey Respondents) vs. Non-Respondents, Sergeants Major Course (SMC) Class 64

Variable	Initial APFT results (unit records)				Final APFT results (unit records)				T-test p-values	
	Survey respondents ^b (n=385)		Non-respondents (n=50)		Survey respondents** (n=385)		Non- respondents (n=52)		Initial (responde nts/non- responde nts)	Final (responde nts/non- responde nts)
	n	mean±SD	n	mean±SD	n	mean±SD	n	mean±SD		
2 mile run (points)*	337	79.5±19.9	38	82.6±12.9	219	86.1±10.5	41	84.9±10.2	0.35	0.50
Push-ups (points) ^a	398	86.3±12.5	44	84.3±12.2	266	88.9±11.8	50	88.7±11.5	0.31	0.91
Sit-ups (points)*	380	87.0±13.0	41	84.9±12.8	250	89.1±11.4	45	86.6±14.2	0.33	0.19
Total score	332	257.3±34.9	37	250.6±43.7	211	266.9±27.9	39	261.9±28.9	0.28	0.31

Notes:

^a Actual (raw) values were not available for the initial APFT, so a comparison of APFT points is shown.

^b APFT records were not available for international students in the evaluation sample (n=21) and among all initially enrolled (n=18).

Appendix E

Comparison of Evaluation Sample and All Other Survey Respondents, Sergeants Major Course (SMC) Class 64

**Table E-1. Comparison of Demographics and Health Behaviors Reported by Survey –
Evaluation Sample vs. All Other Survey Respondents**

Variable	Categories	Initial survey		Follow-up survey		Chi-square p-value	
		Evaluation sample (n=406)	All others who took initial survey (n=50)	Evaluation sample (n=406)	All others who took final survey (n=52)	<u>Initial</u> Evaluation sample/all others	<u>Follow-up</u> Evaluation sample/all others
		n (%)	n (%)	n (%)	n (%)		
Gender	Male Female Missing	362 (89) 44 (11) 0	47 (94) 12 (10) 0	362 (89) 44 (11) 0	46 (88) 6 (12)	0.29	0.88
Age	≤40 41-43 ≥44 Missing	155 (39) 128 (32) 120 (30) 3	18 (37) 12 (25) 19 (39) 1	125 (31) 130 (32) 149 (37) 2	17 (33) 14 (28) 20 (39) 1	0.38	0.79
BMI	<18.5 (Underweight) 18.5-24.9 (Normal) 25.0-29.9 (Overweight) ≥30 (Obese) Missing	2 (<1) 72 (18) 284 (71) 44 (11) 4	0 (0) 10 (21) 29 (60) 9 (19) 2	1 (<1) 72 (18) 283 (70) 48 (12) 2	0 (0) 10 (19) 34 (65) 8 (15) 0	0.35	0.85
Service	Air Force Army Coast Guard Marines International Missing	1 (<1) 379 (93) 1 (<1) 4 (1) 21 (5) 0	1 (2) 43 (86) 2 (4) 1 (2) 3 (6) 0	1 (<1) 379 (93) 1 (<1) 4 (1) 21 (5) 0	0 (0) 45 (87) 0 (0) 1 (2) 6 (12) 0	0.01	0.40
Component	Active Duty National Guard Reserve Missing	367 (90) 7 (2) 32 (8) 0	45 (90) 2 (4) 3 (6) 0	367 (90) 7 (2) 32 (8) 0	44 (85) 1 (2) 6 (12) 1	0.50	0.03
Current cigarette smoker	Yes No Missing	32 (8) 374 (92) 0	5 (10) 44 (90) 0	35 (9) 371 (91) 0	7 (13) 45 (87) 1	0.90	0.26
Current smokeless tobacco user	Yes No Missing	54 (13) 352 (87) 0	4 (8) 46 (92) 0	47 (12) 359 (88) 0	3 (3) 49 (97) 0	0.85	0.01
Injured	Yes No Missing	258 (67) 127 (33) 0	34 (72) 13 (28) 0	93 (23) 310 (77) 2	12 (23) 40 (77) 0	0.46	0.98

Table E-2. Comparison of APFT Performance Reported by Survey – Evaluation Sample vs. All Survey Respondents

APFT event	Initial				Follow-up				t-test p-value	
	Evaluation sample (n=406)		All others who took initial survey (n=50)		Evaluation sample (n=406)		All others who took final survey (n=52)		Initial Evaluation sample/all others	Follow-up Evaluation sample/all others
	n	mean±SD	n	mean±SD	n	mean±SD	n	mean±SD		
2 Mile Run (minutes and fraction of a minute)	330	15.9±1.8	36	15.7±1.7	322	15.9±2.1	36	15.5±1.9	0.53	0.27
Push-Ups (repetitions)	387	56.3±15.1	42	55.0±15.9	393	58.8±17.9	43	59.4±16.9	0.60	0.83
Sit-Ups (repetitions)	363	63.2±14.7	40	58.8±15.4	390	62.3±21.3	42	63.8±14.7	0.07	<0.01

Appendix F

Comparison of APFT data, survey vs. unit records (final survey), Sergeants Major Course (SMC) Class 64

Variable	n	Self-reported Mean \pm standard deviation (SD)	Unit records Mean \pm SD	Pearson product- moment correlation coefficient (Self-reported vs. unit records)
2 Mile Run (minutes and fraction of a minute)	233	15.6 \pm 1.79	15.8 \pm 1.66	0.85
Push-Ups (repetitions)	283	60.9 \pm 15.8	57.4 \pm 15.6	0.90
Sit-Ups (repetitions)	266	66.8 \pm 13.9	64.4 \pm 14.4	0.87
Height (inches)	307	69.3 \pm 3.6	69.0 \pm 3.1	0.86
Weight (pounds)	307	185.0 \pm 26.20	184.9 \pm 25.90	0.97
BMI (kg/m ²)	307	27.0 \pm 2.7	27.2 \pm 2.6	0.86

Appendix G

Summary of All Tobacco Use Survey Responses, Sergeants Major Course (SMC) Class 64

Variable	Categories	Initial survey n (%)	Follow-up survey n (%)	Chi-square, initial vs. follow-up
Cigarette Use^a				
Smoked in Last 30 Days	Yes	44 (10)	43 (9)	0.89
	No	412 (90)	415 (91)	
Smoked 100 or more cigarettes in lifetime	Yes	160 (35)	147 (32)	0.34
	No	296 (65)	311 (68)	
Number of Days smoked in last 30 days	1-5	5 (11)	4 (9)	0.75
	6-20	6 (14)	9 (21)	
	21 or More	28 (64)	30 (70)	
	Missing	5 (11)	0 (--)	
Age at first Cigarette	12 or younger	27 (13)	21 (11)	0.49
	13-17 years old	95 (45)	102 (51)	
	18 or older	87 (42)	77 (38)	
Quit Smoking	Yes I quit smoking	136 (30)	93 (20)	<0.01
	Never Smoked or Current Smoker	320 (70)	365 (80)	
Years Quit Smoking	10 years or less	60 (44)	45 (48)	<0.01
	11 to 20 years	40 (29)	37 (40)	
	21 years or more	12 (9)	9 (10)	
	Missing	24 (18)	2 (2)	
Current Smoker?	Yes	41 (9)	43 (9)	0.84
	No	415 (91)	415 (91)	
Years Currently Smoking	10 years or less	6 (15)	10 (23)	0.16
	11 to 20 years	14 (34)	7 (16)	
	21 years or more	17 (41)	17 (40)	
	Missing	4 (10)	9 (21)	
Cigarettes per Day Last 30 Days	5 or Less	14 (32)	15 (35)	0.78
	6-10	12 (27)	13 (30)	
	11 or More	15 (34)	14 (33)	
	Missing	3 (7)	1 (2)	
Smoked a Whole Cigarette	Yes	215 (47)	199 (43)	0.52
	No	236 (52)	253 (55)	
	Missing	5 (1)	6 (1)	
Smokeless Tobacco Use^b				
Have used e-cigarettes	Yes	Not asked	25 (6)	n/a
	No		428 (93)	
	Missing		5 (1)	
Have used Smokeless tobacco	Yes	140 (31)	117 (26)	0.10
	No	316 (69)	336 (73)	
	Missing	0 (--)	5 (1)	
Used Smokeless	Yes	58 (41)	50 (43)	0.83

Technical Report No. S.0023113-14, Aug 2013–May 2014

Variable	Categories	Initial survey n (%)	Follow-up survey n (%)	Chi-square, initial vs. follow-up
Tobacco Last 30 Days	No	82 (59)	67 (57)	
Days Used Last 30 days	5 days or less 6-20 days 21 days or more Missing	5 (9) 10 (17) 37 (64) 6 (10)	6 (12) 5 (10) 38 (76) 1 (2)	0.19
Number of Cans Last 30 days	1 or less 2 or more		30 (83) 6 (17)	
Number of Pouches Last 30 days	4 or less 5 or more	4 (67) 2 (33)	1 (14) 6 (86)	0.05
Number of Plugs Last 30 days	4 or less 5 or more	2 (50) 2 (50)	3 (--) 0 (--)	
Quit Smokeless Tobacco	Yes I quit smokeless tobacco Never Smoked or Current User	72 (51) 68 (49)	52 (44) 65 (56)	0.27
Years Quit Smokeless	10 years or less 11 to 20 years 21 years or more Missing	37 (51) 16 (22) 6 (8) 13 (18)	27 (52) 13 (25) 7 (13) 5 (10)	0.50
Current Smokeless Use?	Yes No Missing	55 (39) 78 (56) 7 (5)	50 (43) 67 (57) 0 (--)	0.83
Years Currently Smokeless	10 years or less 11 to 20 years 21 or more years Missing	24 (44) 18 (33) 12 (22) 1 (2)	16 (32) 16 (32) 16 (32) 2 (4)	0.50

Notes:

^aCigarette Use was defined as an individual who had smoked 100 cigarettes in their lifetime and had smoked in the last 30 days.

^bSmokeless Tobacco Use was defined as an individual who had used smokeless tobacco products in the last 30 days.

Appendix H

Summary of Dietary Habits Survey Responses,* Sergeants Major Course (SMC) Class 64

Variable	Categories	Initial survey n (%)	Follow-up survey n (%)	Chi-square, initial vs. follow-up
Perception of Overall Diet	Excellent Very Good Good Fair Poor	23 (6) 115 (29) 206 (52) 47 (12) 4 (1)	32 (8) 138 (35) 177 (45) 44 (11) 4 (1)	0.21
Breakfast Consumed per Week	Never 1-2 times per week 3-4 times per week 5-7 times per week	14 (4) 75 (19) 88 (22) 220 (55)	17 (4) 69 (17) 93 (23) 218 (55)	0.88
Largest Meal	Breakfast Lunch Dinner All meals are the same	15 (4) 112 (28) 204 (51) 67 (17)	25 (6) 107 (27) 200 (50) 66 (17)	0.45
Meals from Fast Food Restaurants	None 1-3 meals 4-10 meals More than 10 meals	125 (31) 244 (61) 29 (7) --	133 (33) 237 (60) 27 (7) 1 (<1)	0.70
Cups of Dark Green Vegetables per Day	None 1 cup or less raw ½ cup cooked 2 or more cups raw 1+ cups cooked	50 (13) 181 (46) 166 (42)	51 (13) 149 (38) 197 (50)	0.06
Cups of Coffee per Day	None 1 cup ≥2 cups	145 (36) 104 (26) 139 (38)	145 (36) 82 (21) 171 (43)	0.06
Soda per Day	None 12 ounces or 1 can ≥24 ounces or 2 cans	231 (58) 106 (27) 61 (15)	239 (60) 111 (28) 48 (12)	0.41
Water per Day	None 16-32 ounces per day (2-4 cups) 64 ounces per day (8 cups) 128 or more ounces per day (16 or more cups)	3 (1) 169 (43) 169 (43) 56 (14)	8 (2) 164 (41) 169 (43) 56 (14)	0.50
Energy Drinks per Day	None 1-2 cans 3 or more cans	332 (84) 60 (15) 5 (1)	324 (82) 64 (16) 9 (2)	0.50
Sports Drinks per Day	None 20 ounces (1 bottle) 40 ounces (2 bottles) 60 or more ounces (3 or more bottles)	252 (64) 119 (30) 21 (5) 5 (1)	321 (81) 64 (16) 10 (3) 2 (1)	<0.01

Technical Report No. S.0023113-14, Aug 2013–May 2014

Variable	Categories	Initial survey n (%)	Follow-up survey n (%)	Chi-square, initial vs. follow-up
Dietary Supplements *multiple responses allowed	Do not take	223 (37)	339 (49)	<0.01
	Just started taking	3 (1)	--	
	Vitamins/Multivitamins	165 (27)	101 (15)	
	Weight loss supp	17 (3)	14 (2)	
	Performance/muscle enhancement supp	45 (7)	28 (4)	
	Nutrition enhancement supp	23 (4)	16 (2)	
	Healthy joint supp	38 (6)	27 (4)	
	Other	15 (4)	23 (3)	
	Total	610	690	
Why Take Dietary Supplements *multiple responses allowed	Do not take	210 (35)	339 (49)	<0.01
	Promote general health	160 (27)	96 (14)	
	Give more energy	57 (10)	35 (5)	
	Greater muscle strength	38 (6)	31 (4)	
	Performance enhancer	29 (5)	18 (3)	
	Healthy joints	43 (7)	31 (4)	
	Weight loss	24 (4)	16 (2)	
	Increased endurance	23 (4)	19 (3)	
	Not sure	1 (<1)	1 (<1)	
	Other	15 (3)	2 (<1)	
	Total	600	690	

*Note: The SMC dietician was on maternity leave, so further description of the nutrition program was not available for this report.

Appendix I

Additional Injury Details from Survey Responses, Sergeants Major Course (SMC) Class 64

Injuries 12 months prior to SMC

**Table I-1. Limited Duty Days by Cause for Injuries 12 Months Prior to SMC
(Evaluation Sample, n=406)**

Mechanism	Number injured (% all injuries)	Number with profile (% by activity)	Total Limited Duty Days (% all limited duty)	Average Limited duty days per injury ^a
Overexertion, strenuous, repetitive movement	78(63)	26(33)	879(51)	33.8
Struck against or struck by object	6(5)	3(50)	140(8)	46.7
Fall, jump, trip or slip	27(22)	13(48)	567(33)	43.6
Struck against or struck by object	6(5)	3(50)	140(8)	46.7
Cut by a sharp tool or object	3(2)	1(33)	21(1)	--
Environmental factors such as heat or cold	1(<1)	1(100)	90(5)	--
Other	9(7)	2(22)	24(1)	12.0
Total	124(100)	46(37)	1,721(100)	*37.4

Note:

^a Weighted average: Sum of total limited duty days/(n²)

Table I-2. Limited Duty Days by Activity for Injuries 12 Months Prior to SMC (Evaluation Sample, n=406)

Activity	Number injured (% all injuries)	Number with profile (% by activity)	Total Limited Duty Days (% all limited duty)	Average Limited duty days per injury ^a
Running	49 (39)	20 (41)	705 (39)	35.3
Physical training (not running)	27 (22)	10(37)	294 (16)	29.4
Sports	14 (11)	4(29)	195 (11)	48.8
Walking, hiking, or road marching	9 (7)	4(44)	195 (11)	48.8
Lifting or moving heavy object	7 (6)	2(29)	111 (6)	55.5
Stepping or climbing	4 (3)	2(50)	120 (7)	60.0
Riding or driving vehicle	2 (<1)	0(--)	--	--
Repairing equipment or vehicles	1 (<1)	0(--)	--	--
Other	12 (10)	4(33)	190 (10)	47.5
Total	125 (100)	46(37)	1810 (100)	*39.3

Note:

^a Weighted average: Sum of total limited duty days/(n²)

New injuries during SMC

**Table I-3. Limited Duty Days by Mechanism for New Injuries during the SMC
(Evaluation Sample, n=406)**

Mechanism	Number injured (% all injuries)	Number with profile (% by activity)	Total Limited Duty Days (% all limited duty)	Average Limited duty days per injury^a
Overexertion, strenuous, repetitive movement	45(62)	19(42)	566(42)	29.8
Fall, jump, trip or slip	17(23)	10(59)	286(21)	28.6
Struck against or struck by object	6(8)	6(100)	263(19)	43.8
Other	5(7)	4(80)	239(18)	59.8
Total	73(100)	39(53)	1354(100)	*34.7

Note:

^a Weighted average: Sum of total limited duty days/(n²)

Table I-4. Limited Duty Days by Activity for New Injuries during the SMC (Evaluation Sample, n=406)

Activity	Number injured (% all injuries)	Number with profile (% by activity)	Total Limited Duty Days (% all limited duty)	Average Limited duty days per injury ^a
Running	24(33)	14(58)	410(30)	29.3
Physical training (not running)	16(22)	7(44)	191(14)	27.3
Sports	13(18)	8(62)	421(31)	52.6
Walking, hiking, or road marching	7(10)	3(43)	43(3)	14.3
Lifting or moving heavy object	3(4)	2(67)	44(3)	22.0
Riding or driving vehicle	2(3)	2(100)	172(13)	86.0
Gunshot or blast	1(1)	1(100)	14(1)	--
Stepping or climbing	1(1)	0(--)	--	--
Other	6(8)	2(33)	59(4)	29.5
Total	73(100)	39(53)	1354(100)	*34.7

Note:

^a Weighted average: Sum of total limited duty days/(n²)

Table I-5. Additional Injury-related Survey Data (Evaluation Sample, n=406)

Variable	Categories	Injuries 12 months prior to SMC (Initial survey) n (%)	New Injuries during SMC (Follow-up survey) n (%)	Chi-square, initial vs. follow-up
Permanent profile that restricts participation on APFT event	Yes No	71 (18) 329 (82)	119 (29) 287 (71)	<0.01
Seen by medical professional*	Yes No	84 (68) 40 (32)	73 (82) 16 (18)	0.02
Duty status when injured ^a	On-duty Off-duty	84 (69) 37 (31)	58 (65) 31 (35)	0.52
Injury impact*	No Impact on Duty Little Impact on Duty Some Impact on Duty Major Impact on Duty Unable to Perform Duty	45 (37) 39 (32) 30 (25) 7 (6) 1 (1)	21 (24) 29 (33) 34 (38) 4 (5) 1 (1)	0.18

Note:

^aFor those who were injured (n=125 injuries 12 months prior to SMC; n=93 new injuries during SMC)

Appendix J. Risk of Injury by Demographic, Physical Fitness, and Physical Activity Characteristics, Class 64

Table J-1. Risk of Injury by Demographic, Physical Fitness, and Physical Activities with Any Injury During the Sergeants Major Course, Males, Class 64
(n=342 with medical records)

Variable	Categories	N	Injured (%)	Risk ratio (95%CI)	p-value
Age (years)	≤40	128	67	1.00	
	41-43	111	72	1.07 (0.91-1.27)	0.41
	≥44	103	63	0.94 (0.78-1.14)	0.52
Race	White	191	65	1.00	
	Black	103	69	1.06 (0.90-1.25)	0.49
	Hispanic	26	77	1.19 (0.94-1.50)	0.22
	Asian	6	83	1.28 (0.88-1.86)	0.35
	Other / Unknown	16	69	1.06 (0.75-1.50)	0.76
Marital status	Married	303	67	1.00	
	Single	5	40	0.60 (0.20-1.75)	0.20
	Other	34	77	1.14 (0.93-1.40)	0.26
Education level	No High School	1	100	-----	-----
	High school or equiv.	83	63	0.96 (0.77-1.20)	0.75
	< 4 years college	142	71	1.10 (0.91-1.31)	0.31
	Bachelor's	97	65	1.00	
	Master's or above	17	71	1.09 (0.77-1.53)	0.65
	Unknown	2	100	-----	-----
Current cigarette smoking	Yes	32	59	0.87 (0.65-1.17)	0.31
	No	309	68	1.00	
Current smokeless tobacco use	Yes	127	69	1.01 (0.87-1.17)	0.91
	No	212	68	1.00	
% Body Fat	22.77% or less	114	61	1.00	
	22.78 – 24.71%	114	70	1.16 (0.96-1.40)	0.13
	24.72% or more	114	72	1.19 (0.99-1.43)	0.07
APFT 2 mile run time (tertiles)	Fastest (14.98 minutes or less)	93	57	1.00	
	Moderate (14.99 to 16.23 minutes)	92	64	1.13 (0.89-1.42)	0.32
	Slowest (16.24 minutes or more)	92	77	1.35 (1.10-1.67)	<0.01
APFT sit-ups (tertiles)	Lowest (56 repetitions or less)	105	70	1.13 (0.93-1.38)	0.22
	Moderate (57 to 70 repetitions)	105	69	1.12 (0.91-1.37)	0.28
	Highest (71 repetitions or more)	101	61	1.00	

Technical Report No. S.0023113-14, Aug 2013–May 2014

Variable	Categories	N	Injured (%)	Risk ratio (95%CI)	p-value
APFT push-ups (tertiles)	Lowest (50 repetitions or less)	110	70	1.12 (0.92-1.36)	0.25
	Moderate (51 to 65 repetitions)	114	69	1.11 (0.91-1.34)	0.29
	Highest (66 repetitions or more)	104	63	1.00	
Injury in 12 months prior to the SMC	Yes	113	76	1.21 (1.04-1.39)	0.02
	No	228	63	1.00	
Distance run for personal PT	≤ 6 miles per week	113	71	1.00	0.82 0.23 0.53
	7-9 miles per week	83	72	1.02 (0.85-1.22)	
	10-15 miles per week	80	63	0.88 (0.72-1.09)	
	16+ miles per week	59	66	0.93 (0.75-1.16)	
Frequency of other aerobic endurance training for personal PT	Do not perform	78	59	0.83 (0.68-1.02)	0.05
	Perform ≥ 1 time per week	257	71	1.00	
Frequency of resistance training for personal PT	Do not perform	47	62	0.89 (0.70-1.13)	0.32
	Perform ≥ 1 time per week	288	69	1.00	
Frequency of sprint training for personal PT	Do not perform	130	72	1.11 (0.96-1.28)	0.17
	Perform ≥ 1 time per week	204	65	1.00	

Table J-2. Risk of Injury by Demographic, Physical Fitness, and Physical Activities with Lower Extremity Overuse Injury During the Sergeants Major Course, Males, Class 64 (n=342 with medical records)

Variable	Categories	N	Injured (%)	Risk ratio (95%CI)	p-value
Age (years)	≤40	128	55	1.00	
	41-43	111	62	1.14 (0.92-1.41)	0.24
	≥44	103	55	1.01 (0.80-1.28)	0.92
Race	White	191	54	1.00	
	Black	103	57	1.05 (0.85-1.30)	0.64
	Hispanic	26	73	1.34 (1.03-1.75)	0.07
	Asian	6	83	1.53 (1.05-2.24)	0.16
	Other/Unknown	16	56	1.03 (0.66-1.62)	0.89
Marital status	Married	303	56	1.00	
	Single	5	40	0.71 (0.24-2.08)	0.46
	Other	34	68	1.20 (0.93-1.54)	0.21
Education level	No High School	1	100	-----	-----
	High school or equiv.	83	54	0.99 (0.76-1.30)	0.95
	< 4 years college	142	60	1.10 (0.87-1.37)	0.42
	Bachelor's	97	55	1.00	
	Master's or above	17	59	1.08 (0.70-1.67)	0.75
	Unknown	2	100	-----	-----
Current cigarette smoking	Yes	32	47	0.80 (0.55-1.18)	0.22
	No	309	58	1.00	
Current smokeless tobacco use	Yes	127	58	0.99 (0.82-1.20)	0.92
	No	212	58	1.00	
% Body Fat	22.77% or less	114	50	1.00	
	22.78 – 24.71%	114	60	1.19 (0.94-1.51)	0.14
	24.72% or more	114	62	1.25 (0.99-1.57)	0.06
APFT 2 mile run time (tertiles)	Fastest (14.98 minutes or less)	93	50	1.00	
	Moderate (14.99 to 16.23 minutes)	92	54	1.10 (0.83-1.45)	0.51
	Slowest (16.24 minutes or more)	92	65	1.32 (1.03-1.70)	0.03
APFT sit-ups (tertiles)	Lowest (56 repetitions or less)	105	60	1.24 (0.96-1.60)	0.10
	Moderate (57 to 70 repetitions)	105	62	1.28 (0.99-1.64)	0.05
	Highest (71 repetitions or more)	101	49	1.00	
APFT push-ups (tertiles)	Lowest (50 repetitions or less)	110	63	1.17 (0.93-1.47)	0.19
	Moderate (51 to 65 repetitions)	114	57	1.06 (0.83-1.35)	0.64
	Highest (66 repetitions or more)	104	54	1.00	
Injury in 12 months prior	Yes	113	66	1.23 (1.03-1.48)	0.03
	No	228	53	1.00	

Technical Report No. S.0023113-14, Aug 2013–May 2014

Variable	Categories	N	Injured (%)	Risk ratio (95%CI)	p-value
to the SMC					
Distance run per week for personal PT	≤ 6 miles per week	113	62	1.00	0.94 0.14 0.33
	7-9 miles per week	83	61	0.99 (0.79-1.24)	
	10-15 miles per week	80	51	0.83 (0.64-1.07)	
	16+ miles per week	59	54	0.88 (0.66-1.15)	
Frequency of other aerobic endurance training for personal PT	Do not perform	78	50	0.83 (0.65-1.06)	0.12
	Perform ≥ 1 time per week	257	60	1.00	
Frequency of resistance training for personal PT	Do not perform	47	57	1.00 (0.46-1.30)	0.98
	Perform ≥ 1 time per week	288	58	1.00	
Frequency of sprint training for personal PT	Do not perform	130	65	1.22 (1.02-1.46)	0.04
	Perform ≥ 1 time per week	204	53	1.00	